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GAS JOURNAL

LIGHT ✦ HEAT ✦ POWER ✦ BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CLXXII. No. 3259.] LONDON, OCTOBER 28, 1925. [77TH YEAR. PRICE 1s.

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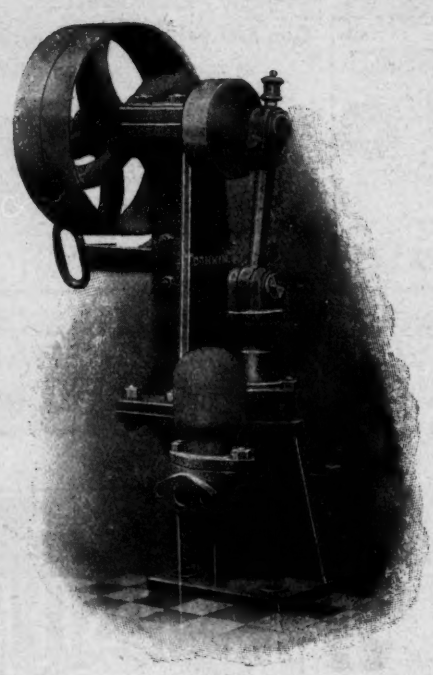

FIG. 536.

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VOL. CLXXII., No. 3259.] WEDNESDAY, OCTOBER 28, 1925. [77TH YEAR.

"Coke Competition" Extra Number.

THE special number of the "Journal" to be published on Nov. 9 will contain the twelve principal winning papers in the Coke Competition. The preparation of the issue is well advanced. We wish to point out (as it does not appear to be sufficiently understood) that this will be an "extra" number of the "Journal," and will have nothing whatever to do with our ordinary weekly issue. The leading winning papers, with the drawings and photographic reproductions, will in themselves constitute a substantial volume; and therefore this extra production will contain no other matter. Its circulation will be considerable. We intend to present a copy to every "Journal" subscriber on our books. Orders for additional copies are being received daily from people concerned not only in the gas industry, but the coke-oven industry. The papers will also be under discussion at the conference which is being organized by a Joint Committee of the Society of Chemical Industry and the Institution of Chemical Engineers; and the latter body will be distributing copies of the special number among their members who would not otherwise receive one. The conference will be held in Sheffield next month; and gas and coke-oven engineers will be invited to be present. The expense of publishing this special issue and presenting a free copy to all "Journal" subscribers will be heavy; but we hope that at all events some part of this will be met by advertisements (it will be a good opportunity for manufacturers and contractors to make announcements) and by sales at 1/- per copy, or 1/3 post free. We shall not print an unlimited number of copies beyond known requirements; and therefore it will be helpful if those who desire copies and have not already sent a definite order will do so within the next seven days. This extra issue of the "Journal" will go to all parts of the world where gas is supplied and coke is made; and we venture to think it will be consulted far in the future as an important contribution to the literature of the coke and of the coal carbonizing industries.

EDITORIAL NOTES.

The "B.C.G.A." Annual Conference.

THE proceedings at the annual meeting of the British Commercial Gas Association at Plymouth, under the presidency of Mr. J. H. Ellis, the Chairman of the local Gas and Coke Company, emphasize several things. One of them is the comprehensive representation of the organization. Among the many there were the President of the National Gas Council (Mr. D. Milne Watson), the President of the Institution of Gas Engineers (Mr. C. F. Botley), the Chairman of the Council of the Society of British Gas Industries (Mr. B. B. Waller), and numerous members of all those bodies. Gas administrators, gas engineers, and other supply officials, and manufacturers of gas plant and gas-consuming appliances mingled as one; and the fact was present in the mind of Mr. F. W. Goodenough, who, in one part of the proceedings, referring indirectly to the Labour-Socialist policy of the nationalization of industries, alluded to the only nationalization which the gas industry knows or cares about, and that is, the nationalization secured by its organizations. This binds every part of the industry into one. We think it would be hardly possible to cite another example of an industry which shows a more compact front than ours. This makes it all the stronger in defence, and, when occasion requires, in offence with protective objective, as well as in good developing work. It means something more; for, when we come to analyse the activities of the organizations, we see what each and all are doing either directly or indirectly to make more effective from the industrial point of view the whole of the men in, or who will eventually be in, responsible position—from the cultivation of a greater interest in and broader outlook upon the general affairs of the industry in Board and Committee rooms, and among officers, and in increasing the competence of coming technical officers and members of the sales or public service staffs.

There is a fine atmosphere about Plymouth—clean and healthy, it interposes no opaque miasma between the sun's rays and its citizens and visitors. The local authorities pride themselves on this, and the Gas Company, as we found in the presidential utterances and in a paper by Mr. Percy S. Hoyte, the Company's Engineer and Manager, take credit to themselves for the part they have played in bringing about this condition. The purity of the atmosphere was noted by that keen observer and advocate of all possible steps being taken to produce and maintain such a condition for health preservation and healing—Dr. Saleeby. The purity and wholesomeness of the atmosphere reflects, too, the quality of welcome and hospitality which the people of Plymouth extend to their visitors. Welcome there is genial and real, as the members of the Association found from the inauguration to the close of the conference. There is no narrow-minded aversion in the borough between municipal electrical trading and private gas enterprise. They are both out to serve, and to do so fully within the compass of their merits and abilities. Thus it was that the Mayor (Alderman R. W. Winnicott) and the Mayoress

not only welcomed and entertained the members of the Association, but his Worship wished them the greatest success in all their efforts, for he knows they are directed to the public good. Moreover, the President of the Association and Chairman of the Gas Company being the quondam Town Clerk provides a link between the municipal government and the gas undertaking which is highly beneficial in the public interests.

The wish of his Worship as to an abundant success for the Association in all their doings applies to the present and the future. They can point to what has been achieved, which alone gives good promise for the future. The appreciation of that work is shown by the industry's support of the organization; the success is attested by the manner in which the rate of progress in gas utilization in the country is maintained. The work is entirely national in character, and ubiquitous in effect. It is because of this that the Committee can boast of increasing support from the industry. During the past year nine undertakings have become members; more which formerly contributed to the finances on a partial basis have become full subscribers, with the result that the past year's income was increased by £4200. In short, the undertakings now furnishing funds number 787, representing no less than 92 p.ct. of the gas supply of the country; and there will not be complete satisfaction until the other 8 p.ct. come in to make the round 100 p.ct. The annual report, and the speech of Mr. Goodenough in moving its adoption, point another aspect of the work of the organization, and that is the flexibility of its operations, and the power of prompt conversion to current requirement. We need not instance all that has been done during the past year. So far as it is diplomatic to divulge publicly, the report tells all that gas men desire to know. But an illustration of adaptability to, and the formulation of schemes demanded by, the circumstances of the times, is the special campaign which is now in full swing. We need not hide the fact that this is our industry's politic method of doing its protecting and stimulating part for gas when the electricity supply undertakings are making special efforts on behalf of their own commodity; and it is also work that is complementary to that which was so well done by the National Gas Council, through their President, in de-electrizing the minds of Members of Parliament and in informing a deluded public. One part of the special campaign is the Prize Essay Competition; and already from all quarters of the country there has come an aggregate of well over 20,000 applications for particulars of it. About £15,000 has been subscribed for this campaign; and a further £10,000 is wanted to round it off properly. When we glance over what has been done by the Association, what is being done, and what will have to be unremittingly done in the future, it is clear that necessity alone ensures the future of the organization. The industry has learned the lesson that it must have political, technical, and commercial machinery, and that this must be maintained in a position to work in the most efficient manner. We cannot, and do not want to, vision the industry without a "B.C.G.A." In his Presidential Address, Mr. Ellis suggested that the members should ask themselves how they would regard a proposal for the discontinuance of the Association. "Suppose the Association put up its shutters!" To be candid, we have no time to spare to cogitate over any such supposition. It will be time enough to trouble our minds in that direction when we see signs of decline in the efficiency of the Association, which careful scrutiny assures us are at present undiscoverable.

During the proceedings there was much said as to the attitude of the Government towards the development of electricity; and if the attention of the Government is drawn to the opinions on that attitude of prominent and competent critics in both the electricity and the gas industries, their confidence must be shaken in this particular specific for industrial depression and unemployment. Any scheme which they are likely to put forward will mean the expenditure of millions to produce—what? Hardly had the meeting of the "B.C.G.A." ended, when the new President of the Institution of Electrical Engineers was, in his Inaugural Address, protesting against the expenditure of millions in the directions which it is pretty well known the Government will suggest, while the money might be better spent to other purpose. It is not electricity the industries and the unemployed require for the amelioration of their conditions, but a reduction of the burdens which have been imposed upon industry, and which are the real hindrances to betterment. And in respect of one heavy burden, the Chancellor of the Exchequer only last week definitely stated that at present he could hold out no hope of further relief in the next Budget. The injustice and folly of the State attempting to develop one industry on artificial and uneconomic lines to the detriment of another were commented upon by Mr. Ellis in his Presidential Address; and Mr. Milne Watson made another powerful criticism of the Government's affection for electricity and low-temperature carbonization—an affection which indicates the poverty of their resources for doing something really effective to help industry and employment in this time of serious depression. But the Chancellor of the Exchequer and the President of the Board of Trade are optimistic as to the New Year seeing things brightening industrially and commercially; and this notwithstanding electricity and low-temperature carbonization schemes still being in a state of embryo, and not accomplished facts and contributing to the revival. Part of Mr. Milne Watson's criticism was directed to an article in the "Daily Telegraph" by Mr. D. N. Dunlop, Director of the British Electrical and Allied Manufacturers' Association, which also forms the subject of the opening notes in our "Electricity Supply Memoranda" this week, and which is a fine study in illogical conclusions. But, apart from that, what Mr. Milne Watson and the President made abundantly clear is that all the gas industry desires is that the competing industries should be left to develop by natural means—by their own inherent power and the stimulus of current requirement. That would be the best course for the country, and the fairest for the industries. It would result in the survival of the fittest in each of the divers applications of gas, electricity, oil, and solid fuel, and that must be to the ultimate advantage of the nation.

On this occasion we will not discuss the papers read at the conference; but will merely mention that they were by Mr. Percy S. Hoyte on "Housekeeping without Tears;" by Prof. John W. Cobb, on "Conservation of the Nation's Store of Solar Energy;" by Dr. R. Veitch Clark on "Conservation of the Nation's Resources of Human Energy;" and by Mr. Robert W. Ascroft on "Conservation of the Nation's Vegetation." It will thus be seen that the question of conservation extended from latent energy by the science of life in various phases.

Just as the gas industry is developing its primary business, so the "B.C.G.A." are developing their activities and value. And in no inconsiderable degree the former is a consequence of the latter. We see every reason for confidence in anticipating continued upward travel in good work; and when we come to look back upon the twelve months on which the organization is now entering with Mr. John Edward Cowen, the Chairman of the Newcastle-on-Tyne and Gateshead Gas Company, as President, we shall be surveying a year's progress of loyal and efficiently conducted operations as we are to-day at the close of the presidency of Mr. Ellis.

Cramped!

We know what it is to try to manufacture gas on a congested site. It cannot be done with the same efficiency and economy as upon a more roomy site; and, moreover, a site already congested has no capacity for development. With a progressive business in such circumstances, there is one of only two things to be done—to secure an extension of the site or to purchase a new one. This is a rough simile perhaps, but the state of the congested works is the condition to-day of the Leeds University; and the time has arrived when, if a sufficient inflow of highly-trained students to the industries is to continue, and if research is to be developed, more housing accommodation must be provided. The need of industry for more qualified men and for research and discovery grows; and therefore the greater is the demand from those industries for the service of which the Leeds University has largely specialized. The authorities have for some time past been feeling the strain of developing work in face of the shortage of accommodation; and they have been temporizing with the position as best they could. But the temporary buildings and neighbouring dwelling-houses which have been brought into use could only be unsatisfactory expedients, and not conducive to smooth and convenient working. Therefore the Leeds University authorities feel

that it is no longer wise to continue as they have been doing, and that a serious effort must be made to raise the necessary funds for bringing about the required building reformation. Nothing but absolute necessity would have compelled them to do this just now when industrial depression is rife. But throughout the country there is an awakening of hope of better times; and in those better times trained men and research will take an important part.

The gas and other fuel industries are concerned in several departments of the University's work; but in one more than the others. For some time, it has been well known that the work carried on in the Coal Gas and Fuel Industries Department had outgrown the available accommodation, and that the day was at hand when it would be imperative that the deficiency should be made good. That day has arrived. Hence the appeal which has been made, and which was printed in the columns of the "Journal" a fortnight since. Regarding it, there are two points relating to the existing conditions which are not widely known in the gas industry, and which furnish, apart from the actual work (which is the most important commendation), considerations which should have influence in producing the £30,000 required to provide the adequate accommodation for the Department, and the additional £3000 per annum which is needed to supplement its present revenue.

The first point is that the building which at present is shared by the Coal Gas and Fuel Industries and the Department of Mining was erected in 1906 with the aid of a fund raised by the West Yorkshire Coal Owners. The building is big enough for fuel or mining; but the development of the Coal Gas and Fuel Department—in research particularly—and the increasing activities of the Mining Department, have rendered the building altogether too small for the housing of both. It would be large enough for one; and the other must have accommodation in a new building. There is, however, a good reason why the work of the Coal Gas and Fuel Industries should continue to occupy the old building—namely, that the new experimental gas plant stands alongside, so that it would be very inconvenient to move to new quarters. At the same time, it must not be forgotten that the building which the Coal Gas and Fuel Industries Department wishes fully to occupy in the future was erected nineteen years ago largely (as already stated) by the aid of a fund raised by the West Yorkshire Coal Owners' Association. It is therefore incumbent upon the gas and fuel industries to do their part towards providing a home for the Mining Department. We are kindred industries, and have many problems in common. But we are the debtors to the mining industry for what was done in 1906.

There is the second point. We know that the opinion is rather extensively held that the gas industry actually and completely finances the work of the Coal Gas and Fuel Department. That is a mistake. The industry makes substantial contribution, which is valuable, and is constantly referred to in terms of high appreciation by the University authorities. The fact is that, although the research work carried on there is in major part for the direct service of the gas industry, a considerable contribution towards the work and the upkeep has to be made from the general funds of the University. On this point, we may quote from the appeal which was published in the "Journal" on Oct. 14 (p. 91):

> The work of such a Department as this is necessarily costly, and, in spite of the financial assistance given by the industries, a considerable charge falls annually upon the very limited funds of the University. The total cost of the Department in the year ended July 31 was £8285. The income from the Livesey Memorial Fund was £434, the Institution of Gas Engineers contributed £3534, and the Benzole Research Association £1197, in aid of research; the Board of Education and Leeds City Council grants were £316; and students' fees amounted to £382. The balance of cost—£2432—was met out of the general funds of the University.

That is the position. Such work as the Department is engaged upon—work, we repeat, mainly for the gas industry—is necessarily costly, though there is studied economy so far as efficiency will permit. But as the figures disclose, the Department is far from being self-supporting through existing endowment and contribution; and it is altogether impossible for the University to meet both the annual charge upon the funds and provide new buildings. Hence the appeal primarily for building purposes; but we should like to see the fuel industries of the country not only satisfy the requirements in this respect, but make the Department wholly independent.

The Department—with such a conscientious and indefatigable worker as Prof. Cobb at its head, and a staff loyal to him and to the work with which they are entrusted—has won the perfect confidence of the industries concerned in it, which industries have learned that men of high scientific qualification and persistent, careful research are as indispensable to them and their progress as are fertilizers to the soil and the production of generous crops. We hope for a full response to the appeal that has been made, and not before conditions insisted. In this connection, there is one point which should be made clear—that, although we all have the general appeal of the University at heart, it may facilitate or justify contributions from some quarters if it is known that these can be ear-marked for the special departments.

Work at the Fuel Research Station.

The report of the Committee of the Privy Council for Scientific and Industrial Research for 1924-25, together with that of the Advisory Council, constitutes an illuminating document, and illustrates the large expansion being made by the Government in the work of scientific research for the benefit of the country generally. The report was noticed in our issue of the 14th inst.; and other cullings from it are published this week. The developments are the natural outcome of the efforts made by successive administrations towards a better co-ordination of the work done for the State, and of the growing appreciation on all hands of the contribution science can make, if steadily pursued, to the solution of the difficult problems of modern administration and economic reconstruction. As the Prime Minister recently said, no one can assert that British industry can be saved by science alone; but scientific methods and men must take their place with the administrator and the financier if industry is to be strong and resilient enough to meet the shocks it is bound to encounter as the years go by. There can be nothing but agreement with the Committee when they say that the possibilities of a systematic application of the growing stream of scientific knowledge to industry are immense, and probably incalculable; but it has to be remembered that the conscious effort to make use of the discoveries of the laboratory is of comparatively recent date. The report discloses what we must all applaud, and it is that the Department are not only developing work by the aid of their own staffs and resources, but are, on generous lines, cultivating real living links between their work and the industries themselves. That is the way of large potentiality and practical result.

We have seen and experienced this in the carbonizing industries through the work at the Fuel Research Station—first under the direction of the late Sir George Beilby (to whose personal attributes and scientific and industrial attainments the Committee pay tribute), and now Dr. C. H. Lander. The work of the Fuel Research Station, of course, represents only a fraction of the total activities of the Scientific and Industrial Research Department; and naturally that work goes far beyond the immediate interests of the gas industry. However, regarding the investigations at the Fuel Research Station, one cannot measure the results in terms of money. It is the same with all scientific research. In addition to direct beneficial result, there is much that is negative, and yet has value in the proof it affords. Much time and money have been expended on the investigation of the low-temperature carbonization process, with the primary view of finding a suitable solid smokeless fuel, while not neglecting fuel oil, light spirit, lubricants, and gas. The results have over and over again been of the nature expected, but never of an order which has given satisfaction regarding the commercial soundness of the system, subject as all the products are to severe market changes. This authoritative proof has been valuable, both to the public and to industry—particularly to the former, who have suffered lamentably in pocket from the exploitation of low-temperature promotions. The experiments in this connection at the Fuel Research Station have taken divers lines. It is now acknowledged that the

briquetting of coals under pressure at a temperature of 200° to 300° C., and then carbonizing in a simple form of cast-iron retort, has not been successful; and this line of investigation has been abandoned for the time being. It has been found possible to carbonize a suitable blend of fine coal in the retorts without pre-briquetting; and the result is a good solid fuel. There are a few minor difficulties to be overcome before the process can be regarded as entirely satisfactory; but these are more mechanical than anything else. However, if it is solid smokeless fuel that is required, why does not the Fuel Research Station indulge in an investigation to ascertain whether, with the high-temperature carbonizing plants that exist in every city and town, something cannot be done in them to produce a solid smokeless fuel—without sacrificing volatile matter—by blending, producing changes in the structure and density of coke which will enhance ignitibility and combustibility. Seven years have passed since Sir George Beilby first started to work on the low-temperature problem; and commercial success has not been achieved. And yet, through the high-temperature carbonizing plants in existence, other practical lines of work might yield results of more immediate value to the public. Assuming the Fuel Research Station has struck the way of technical success with low-temperature carbonization, there will still be required proof of commercial success. The one is not much good without the other; and, in the circumstances of high-temperature carbonization, commercial success is assured.

However, low-temperature carbonization is only one direction in which investigation has been made. In connection with the gas industry, we have to acknowledge the very valuable work achieved at the Fuel Research Station, in connection with the economic development of the production of gas therms by steaming vertical retort charges, and the more modern research into the enriching of gas produced in continuous vertical retorts (when high percentages of steam are used) by the injection of gas oil into the retorts, as suggested by Mr. Samuel Tagg when President of the Institution of Gas Engineers. The work in this relation was noticed in the "Journal" for Oct. 7. At the present time a battery of horizontal retorts is being erected at the station, with the view of obtaining information as to their working, and to test the behaviour of coal in this class of retort. The gas industry is much indebted to the Fuel Research Board for the amount of investigation that has been carried out in connection with its processes; and, therefore, we hope that what is said in the foregoing paragraph will not be regarded as in the nature of a complaint, but merely as a suggestion for work which might lead to a prompt effective result in the public interests. At the Fuel Research Station there is a mass of information as to the behaviour of blended coal submitted to low-temperature carbonization; but we are not aware that the investigation has there been carried into the realm of high temperatures.

First Prize in the Coke Competition.

The first prize (£200) in the Coke Competition was fairly won by the Technical Research Staff of the Woodall-Duckham Companies; but in view of the fact that the £1000 for the competition was handed to the Editor of the "Journal" by those Companies, the Research Staff have been debating among themselves whether or not they ought to profit by their success. Naturally they are highly gratified that in such a positively fair adjudication they were the winners of the leading award. In the peculiar circumstances, they think the honour suffices, and so have settled the matter of the retention of the money by handing the cheque to Sir Arthur Duckham, who has forwarded it to the "B.C.G.A." as a contribution from the Research Staff to the special publicity campaign funds. Mr. Goodenough made an announcement on the subject at the annual meeting of the Association at Plymouth.

"B.C.G.A." Gas Competition.

If the many thousands of people who have made application for particulars of the prize competition scheme of the "B.C.G.A." send in contributions, there will have to be an army of judges in order to make adjudication within a reasonable period.

The End at Wembley.

We shall all regret the final closing of the British Empire Exhibition. The memories of it are very happy ones; and it has faithfully performed its mission of educating the public as to the might and immense resources of the British Empire. The end will be on Oct. 31; and by Nov. 30, if scheduled times are kept, the whole of the hundreds of thousands of tons of exhibits will be on their way home, and part already there. Then the big buildings will stand silent and derelict, and present much the same appearance as we witnessed before they were packed with the vast and glorious illustration of the Empire's products.

Coke Merchants' Tricks.

The "Evening Standard" has discovered, in the annual report of the London County Council, sufficient material on the subject of "Coke Merchants' Tricks" to occupy two-thirds of one of its columns. But it is all merely a *réchauffé* of the report presented to the Council some months ago on the subject of coke retailers selling by measure instead of weight, and giving short measure in sacks. There was also a suspicion as to coke being watered when sold by weight. This was more a suspicion than an actuality; but the other violations of honesty have truth in them—in some cases. Gas undertakings were shown to be free from all guilt in the matter. But we do not like the title "Coke Merchants' Tricks," inasmuch as it has a comprehensive appearance; and it is far from true that all coke merchants are culpable. There are honest coke merchants as well as dishonest ones. But judging from the number of municipal authorities who include clauses in their Acts giving them power to regulate the selling of coke, there seems to be a real necessity for control over some retailers. The annual report of the London County Council reproduces the view that there should be general legislation providing for the sale of coke by weight, and making it a penal offence to water it beyond its normal content of moisture. As pointed out on a previous occasion, this latter matter would be a difficult one with which to deal.

Housing Scheme Tenants.

There have been several references in the "Journal" to the autocratic decisions of municipal authorities owning electricity undertakings to attempt to compel tenants of housing schemes to utilize electricity for all purposes, despite the freedom given by the General Gas Acts to all householders to demand a supply of gas should they desire it, unless there is sufficient impediment to compliance. The Select Committee's decision on the Newport (Mon.) Corporation Bill showed that Parliament are averse to dictatorial acts of the kind. The tenants of municipal houses are also determined to have some say in respect of the disposition of the appointments in such dwellings, where this is possible. We remember some time ago on a certain housing estate in the South London district, the tenants rebelled against the compulsory use of electricity, and gas obtained a large innings. And that is not the only instance in which municipal tenants have objected, and have carried their objections to a rational conclusion. Now we see that there is a revolt at Norbury, in the area of the Croydon Corporation, regarding the kitchen-parlour system imposed on the tenants by the housing authority. Very properly they object to the fumes of cooking in the room in which they live. Consequently, the tenants are having gas cookers installed in their sculleries. According to the report before us, the tenants take the view that the Croydon Council, in following the assumption of municipal authorities all over the country that the modern working man's wife wants to cook in her dining-room, are completely out of touch with the views of the class of people for whom the houses are designed.

Indifference to Air Pollution.

As a protagonist, Lord Newton is not to be surpassed. Once he takes up a matter, he sticks to it until he wins or knows he is defeated. The smoke nuisance is something which he holds ought not to be; and therefore he is not likely to leave it alone until something really effective is done by Parliament in regard to it. His Lordship was speaking the other

day at a smoke abatement conference held in connection with Leeds Health Week; and what he then had to say showed that he is utterly amazed at the indifference of people to the question. That indifference is, we think, due to the combination of custom and ignorance. While Britishers pride themselves in being cleanly people, there are parts of the country which are dirtier than any other place in Europe; and this is a positive disgrace to us nationally. No prominent interest in the matter has been shown by Parliament; and social bodies and the Press exhibit apathy in respect of it. In his Lordship's opinion, air pollution by smoke should be treated as a national nuisance.

Road Work in Rural Districts.

Report says that the Ministry of Transport have recently made grants towards the cost of rural road schemes, on which a total sum of £300,000,000 is to be expended. By agreement between the Treasury and the Ministry, there is to be an increase in the next financial year by £750,000 of the large provision already made for the needs of rural districts. It is understood that the new provision can be used for unclassified roads; and it has been agreed that every authority which is essentially rural shall be entitled to participate. On the other hand, this financial assistance is only to be given for definite improvement—such as strengthening, surfacing, or tar-spraying, and not for ordinary patching or maintenance. The grant will not exceed 50 p.ct. of the expenditure; and where the improvement is temporary, such as re-surfacing or tar-spraying, it will be limited to 25 p.ct. of the money spent.

The 43, Cannon Street Group.

We spoke a little early the other week as to a visible falling-off of the activities of the 43, Cannon Street gang of company promoters. Probably they have only been resting—not sleeping. They have revived the Southern Counties Electric Light and Power Supply prospectus, have given it a modern date, and on it and the accompanying literature there appears the stamp of the National Scheme for Disabled Men. This may attract a few elderly ladies with money to confide to these benevolent gentlemen, who offer 7 p.ct. interest on debentures, and then, "after payment of 8½ p.ct. [underlined and in black type] per annum to the holders of preference shares, and thereafter not exceeding 10 p.ct. per annum to the holders of notes or bonds (if any), the remaining net divisible profit shall be equally divisible among the holders of the ordinary and preference shares issued and paid up." The Company have offices in London, Eastbourne, Bournemouth, and Exeter, in all of which places provision has been made of excellent supplies of electricity without the Company's kind assistance. The names on the Board of Directors are not unknown to the recipients of the 43, Cannon Street prospectuses; and the list is headed by a name which has for years done yeoman service to these promoters—Sir Charles B. H. Soame, Bart. It has become quite a habit for this Baronet to be a Chairman of "enterprises" floated by the 43, Cannon Street coterie. Thompson, the Solicitor, and Turner, the Auditor, also figure, as usual, on the prospectus. Reports and estimates appear which predict a venture which will exude gold from every pore. In the information as to contracts entered into, we see in one place the Electricity Finance and Distribution Corporation, Ltd., of 43, Cannon Street, are mentioned; in another place lower down, the same Corporation give 121, Cheapside, as their address. The modernized prospectus has had a good circulation in Wales; but we guess the people of Wales will not be easily taken in by it. We criticized the Southern Counties Company on a previous occasion when the original prospectus was issued with all its extravagance, pretence, and vagueness, and obvious omission of much necessary definite information.

Labour Alliance.

Three large labour organizations have definitely decided to enter into the new Labour Alliance. Their active membership totals 1,152,550, made up as follows: Miners' Federation, 800,000; Transport Workers' Union, 290,000; Associated Society of Locomotive Engineers and Firemen, 62,550. A conference of all the Unions concerned in the Alliance will be held in London on Nov. 5.

ELECTRICITY SUPPLY MEMORANDA.

An article which, for pure assumption and sheer postulation, it would be hard to beat has appeared in the "Daily Telegraph" from the pen of Mr. D. N. Dunlop, Director of the British Electrical and Allied Manufacturers' Association. We have not heard of Mr. Dunlop possessing any particular technical qualification for writing authoritatively on the subject of coal carbonization; and so far as the article deals with electricity, he has omitted various points which would have given it greater completeness. It seems that an electrical policy is wanted, and that a national issue is involved. We will not deny the former because it is no business of ours; but, being identified with an industry which has as much concern as electricity in the country as a public utility, as a taxpayer, and as dependent upon the revival and progress of its industrial fortunes, we do dispute that there is a national issue involved for electricity any more than for gas, for water, or food supply. There has been much loose reasoning over the consideration of electricity from the national point of view; and we find this continued in the present article. Regarding the coming of a national electrification scheme, Mr. Dunlop appears to be dubious; "the prospects," he says, "of a realization of a sound electrification scheme are still remote—vague promises, and few details of practical schemes."

An Electrical Policy Wanted.

Manifestly Mr. Dunlop does not agree with those authorities who contend that the wisest course would be to abandon all idea of interference with the natural growth of the industry, and allow full liberty to expand or decline. We have not heard of any idea that the electricity industry is likely to decline in the absence of Government interference. But he says that the doctrine of the authorities referred to may have a certain aptness when applied to industries open to intense foreign competition like electrical engineering, where it is almost a condition of existence that the utmost possible efficiency should be realized, and a steady adjustment be made of costs and prices to the demands of the market; but in the case of a national service like electricity supply, it is essential that it should be treated to give the greatest benefit to the nation. But what of gas and water? There is just as much reason why gas should be treated to give the greatest benefit to the nation, particularly in view of what Mr. Dunlop later says as to the necessity of carbonizing coal, in order to obtain the maximum benefit from it. With some elation, he submits that the success of the electrical engineering industry has been due in no small measure to the fact that it had at no time in its history the benefit of the slightest protection, either in tradition or in legislation against competition. Spurred by this competition, it modernized its workshops, used electrical machinery to the maximum for manufacturing processes, embarked on comprehensive schemes of research, and engaged an efficient sales force. The result of this has been comparative immunity from the industrial depression which has existed the last four years, and a steady rise in overseas trade. Mr. Dunlop totally ignores the competition to which the electricity supply industry has been exposed from the gas industry; and it would be interesting to know whether or not our rivals require that competition to be more strenuous, in order to spur it on to modernize its methods, and to promote a more efficient sales force. We were under the impression that the Electrical Development Association was—partly if not wholly—formed in order to counteract the activity in competition of the gas industry, and to attempt to take from the latter part of its territory, if not entirely to obliterate it. How successful it has been in this is shown by the large expansion in the girth of the gas industry's business during the past few years. In our opinion, the competition of the gas industry has had just as stimulating an influence upon electricity supply as foreign competition has had upon the electrical engineering industry. If it has not had influence in this way, then it shows a serious weakness in the supply industry which no national scheme of treatment for its development would remove. In passing, it is interesting to note that Mr. Dunlop considers that the electrical engineering home market is now on the verge of depression; the additions and extensions to generating plant held in abeyance during the war and during the early years of the Electricity Commission having now been made good. Therefore, 1925 will represent what may be considered a normal year.

A Question of Competition.

Mr. Dunlop says that during this year the full effect of stagnation in electricity development, coupled with serious depression in the major industries, has come home to the electricity industry. In our opinion, that is only an effect of the inter-relationships of industries. It is also shown by the slump in the secondary products of the carbonization of coal; and it is only on the domestic gas side of our industry's business that the year, so far as we have been

Stagnation or Development.

able to trace, will show a fair amount of development, and we fancy the electricity industry will exhibit the same experience. As a matter of fact, Mr. Dunlop himself discloses by data he quotes that the electricity supply industry is not likely to have anything serious of which to complain, having regard to the state of trade, over which neither that industry nor the gas industry has any control. He says that he considers that a country which has reached only one-fifth of the electrical development of the United States, and has kept this ratio unchanged during the last four years, with a decline in 1925, is definitely "stagnant." Even the rate of progress in this year has fallen considerably. How Mr. Dunlop knows this is not explained. But he proceeds to state that the increase in the generation of electricity in 1923-24 was 18 p.ct.; while in 1924-25, it was 11 p.ct.; and, in his view, it will "probably" be even less than 11 p.ct. for 1925-26. He states that these are figures which require explanation if we are to believe those who assert that electrical progress has been one of the most marked features of this year. In addition to this, he declares that the branches of the industry most in touch with industrial requirements are now sharing the depression of other industries, and are moving fairly rapidly towards a crisis. It is because of this that he says to those who criticize any policy destined to encourage electrical progress in Britain under the plea that no one national activity should be encouraged: "I would answer that we are concerned here not with one national activity but with the entire industrial production of the country." Precisely the same thing could be said by the gas industry if it desired to do so. Therefore we see nothing to justify Mr. Dunlop in asserting that there never was a time when the need for a progressive electrification policy was indicated more clearly, or the urgency for a definite statement of Government policy regarding electrical development more vital. It is not true that, depending on this, is the prosperity not of one industry only but of many industries. The industrial position of the country would not be affected in any degree by a Government scheme for developing electricity supply. The depressing burdens of the industries of the country lie in other directions, as Mr. Dunlop knows quite as well as the industrialists themselves. A more one-sided statement and never a less comprehensive one have we seen than this article by Mr. Dunlop. Underlying it are the interests of the electrical plant manufacturers.

Low-Temperature Carbonization.

Then Mr. Dunlop intrudes into the realm of carbonization; but here at first he is inclined to be a little cautious until he gains courage, for he covers himself with the remark that "When we enter into the sphere of carbonization of coal, high or low [he might have added "temperature"], with the recovery of bye-products, on a national scale, the ground is not so sure, and the possibilities of error both in perspective and in policy are endless." His caution soon leaves him. Having spoken somewhat slightingly of the talk of coal conservation in these times when centuries separate us from coal exhaustion, he says that what is wanted is effective utilization; and his assumed boundless knowledge of these things prompts him to say that our existing methods of high-temperature carbonization are not calculated to do this. We should like to have the opportunity of putting Mr. Dunlop under examination on this subject, and on much else that he has to say in the same connection. He believes that the poor coal at present thrown on the spoil heaps should be used for steam-raising, but he does not give any consideration to the question of how much this would reduce the efficiency of the steam-boiler plant. Further, in his opinion, the good coal should be carbonized by some method which would obtain the minimum of gas and the maximum of products which might be stored and placed directly on the market—oil, chemicals, fertilizers, dyes, and coke. Mr. Dunlop dogmatically asserts that the "only process" capable of doing this is low-temperature carbonization. This view is based on the fact that it is already practised on the commercial scale in the United States and Germany, and not on the uncommercial results which have been experienced in this country, which results are intensified in the present position of the markets for the products to which he alludes. We fail to see why the minimum of gas should be produced; and as to the maximum of products which can be stored and placed directly on the market, perhaps Mr. Dunlop is unaware that there are at the present time large quantities in store, and that the absorbing capacity of the markets at the moment has caused a woeful slump. To-day the low-temperature process stands less chance of success with its low production of gas than it would have done in bygone years. The low-temperature process is one which would feel market oscillations more rapidly than either the gas or the electricity supply industry has ever done, or is likely to do. And as to coke, research is directing the gas industry into channels which will produce a grade of material which will give high-temperature coke all the qualities that a smokeless fuel requires without wasting the volatile matter of coal as is the case with low-temperature processes. So we go on finding in Mr. Dunlop's article nothing but postulation and hypothesis, until we come to the final words: "Industrial electrification, main line electrification, and rural electrification are essential to the revival of trade in Britain." This is not true. There are other things which are more essential to the revival of trade—such as the reduction of imperial and local taxation, the recognition by trade unions of the part that their membership should take in increasing production, and so contributing to those conditions which will reduce market prices, and thereby yield the wherewithal for higher wages. There has been much fiction published regarding industrial electrification. To that fiction Mr. Dunlop has contributed.

Consumption and Population.

The Western Centre of the Institution of Electrical Engineers recently listened to an address from their Chairman (Mr. J. W. Burr) which is full of point, and moderate in tone, but which indicates that the author is craving for a very full life for the electricity supply industry, but not in the direction planned by modern official and political tendency. He is obviously disappointed with the progress that electricity has made in relation to population; but his survey of the causes for this is somewhat restricted. He pays attention only to the inherent ones of the industry, unless the report we have been reading suppresses parts of the address. Mr. Burr finds that in 1922-23 some 80 p.ct. of the undertakings in Great Britain had not reached a sale of 100 KW.-H. per annum per head of the population, and that sales of 300 KW.-H. per head of the population had been attained in few cases only. He compares these figures with those given by Continental engineers at the World Power Conference. In Norway, for example, the "estimated" annual consumption per head of the population was 2000 KW.-H. While aware that these figures apply to hydro-electric stations, Mr. Burr sees no reason why the difference should be so great. One reason is that in Norway water-power generated electricity is cheap, and we believe there is a fair amount of truth in the statement that Government or municipal subsidies are not unknown. Another reason is that coal is an import; and gas is no so cheap as it is here, and yet the gas undertakings are making progress. There are variations in conditions which account for a large slice of the difference in consumption per head of the population.

Old Routes to Improvement.

Mr. Burr arouses interest by asking, "Do we realize that domestic consumers can easily become the greatest and most important of all users?" If it is so easy, why is it not done? Being easy, it would be interesting to know how the consumption of electricity in Mr. Burr's supply area stands per head of the population. However, we look in the address for the means by which the domestic consumers can be easily made the most important of users. What we find is that electricity must be made more available. The cost of running mains or transmission lines must be reduced; and this can only be done by co-operation with the cable, transformer, and switch manufacturers. Those altruistic gentlemen will be interested in Mr. Burr's belief that a great reduction in prices can be made if they will only take the matter in hand. Then the Electricity Supply Acts require real expansion; and attempts should be made to remove many of the restrictions which not only hamper the industry, but are in his view unnecessary. A shock comes when we read that, after all the electrical inventive power that has been expended on tariffs, and the discovery of bases for them which have not the remotest relation with the supply, "no tariff obtains to-day in this country such as to induce the domestic consumers to use electricity for all purposes." It is admitted that the backwardness may be partly due to the cost of the apparatus. Then it is seen that Mr. Burr is a believer not in super-power stations, but in ordinary well-equipped stations situated close to the area in which the demand exists, and linked-up to each other for mutual assistance. He inclines to the view that the small difference between the thermal efficiency of these stations and that of the super-power stations would be neutralized by transmission costs and losses, which is an opinion we have long shared. In his judgment, as much attention should be paid to the reduction of distribution costs as to lowering generating costs. Then, in order completely to solve the problem, electricity undertakings must deal with wiring and equipment for all domestic purposes. Mr. Burr estimates at £115 the cost of equipping a villa residence of (say) seven rooms for all purposes. He can only suggest mass production as the means to effect a reduction in this heavy expenditure. Those are the lines along which Mr. Burr would bring about an increase in the consumption of electricity per head of the population. We have no comment to make upon them, other than that there is nothing new in them—taken either singly or collectively. Cannot the electricity industry produce a little novel suggestion for discussion, and (if approved) for adoption, in this connection?

Is He the First?—One of the municipal candidates in Liverpool (Mr. Ernest E. Edwards) states that he "stands for progress, smoke abatement, and sound municipal finance." A correspondent asks if he is the first municipal candidate to make smoke abatement a feature of his proclaimed policy.

THE EDUCATION SCHEME.

By WALTER HOLE, Organizing Secretary.

The numerous letters received asking for information show that, notwithstanding the many explanations which have been given, there is still a widespread misunderstanding of the purport and bearing of the final paragraph of clause 6, section 1, par. 8, of the Education Scheme.

The paragraph reads as follows:

> "In general, a student who has obtained the Ordinary Certificate in Gas Engineering in a course in which special emphasis is laid upon chemistry should devote himself to engineering subjects in the Advanced Course, and *vice versa*."

On this it has been erroneously concluded that a student who has taken a three years' course for the Ordinary Grade Certificate, and then wishes to follow the above advice, must for the Advanced Course take 4th and 5th year subjects. This, of course, is both absurd and impracticable. No one could possibly take 4th year classes in any subject which he had not previously studied; and if he could, there are not many technical schools in the country where subjects can be taken to 5th year standard. To insist, therefore, on 5th year standards would be to penalize unfairly a very large number of students.

The practical outworking of the clause will be seen by considering in detail the Typical Courses C as published in the "Abbreviation of the Scheme" in the "JOURNAL" for April 22, p. 235, and of which reprints are now obtainable on application. Suppose a student of 16 years of age to be commencing these Courses. Then the classes will be as follows:

First year	Mathematics	First year
	Physics, Th. and Pr.	" "
	Chemistry, Th. and Pr.	" "
Second year	Mathematics	Second year
	Physics, Th. and Pr.	" "
	Chemistry, Th. and Pr.	" "
Third year	Inor. Chemistry, Th. and Pr.	Third year
	Org. Chemistry, Th. and Pr.	First "
	Drawing for Gas Engineers	" "
	Gas Engineering	" "

In the final year of the Course for the Ordinary Grade Certificate in Gas Engineering, therefore, the student actually only takes one subject to the standard of third-year work. The other three appear in the Course for the first time, and are therefore first-year classes.

When the student proceeds to the Advanced Course as set out in C, his classes become:

First year of Course for the Higher Grade Certificate	Mathematics	Third year
	Mechanics, Th. and Pr.	First "
	Engineering Drawing	Second "
Second year of Course for the Higher Grade Certificate	Building Construction	First year
	Mechanics and Heat Engines, Th. and Pr.	" "
	Gas Engineering	Second "

Assuming that the student is successful in passing all his examinations, at the end of the five years he will have received instruction up to the standard of, and will have secured, the following certificates:

Mathematics	Third year
Inor. Chemistry, Th. and Pr.	" "
Org. Chemistry, Th. and Pr.	First "
Physics, Th. and Pr.	Second "
Eng. Drawing	" "
Mechanics, Th. and Pr.	First "
Mechanics and Heat Engines	" "
Building Construction	" "
Gas Engineering—Ordinary Grade.	
" " Higher "	

Though the Courses together run for five years, no one subject in the above list is taken further than the third-year standard.

It is the peculiarity of the gas industry that it is based upon such widely differing sciences as chemistry and engineering, both of which are equally important. The three following alternatives therefore presented themselves:

1. To base the Course altogether on engineering subjects, and carry these through the whole five years of the Course to the fifth-year standard, to the exclusion of chemistry.
2. To base the Course altogether on chemistry and allied subjects, carrying these through the five years of the Course to the fifth-year standard, to the exclusion of engineering subjects.
3. To secure in the five years a good all-round knowledge of both engineering and chemistry and their allied subjects, leaving the student, in the two years which must elapse before he becomes eligible to sit for the Diploma examination (the minimum age of candidates for which is 23 years) to carry his studies further along either line as may best suit his inclination and opportunities.

There will be little doubt among those who give the matter the serious thought it deserves that the Institution were well advised in their choice of the third alternative. The position may therefore be summed-up in a sentence: While students who find it impossible to take both groups may take either chemistry or engineering and their allied subjects to fifth-year standard, in order to qualify for the examination for the Higher Grade Certificate, it is advisable, as a general rule, to take both groups, though in this case it is impossible to take any one subject to more than the third-year standard. Obviously this gives a much broader foundation on which subsequent studies may be built.

Other points of general interest which have been recently raised may be put in the form of question and answer.

Q. 1. When a student taking a "Grouped Course" has to repeat a subject owing to his having failed therein, must he attend the class again, or need he only sit for examination?

A. Having put in his attendances at class he need only sit for the examination. It is for him to consider whether, having failed once, it is not far better to attend the classes again than risk another failure.

Q. 2. When a student has to repeat a subject owing to his not having taken the examination, must he attend class again or need he only sit for the examination?

A. Same as to question 1.

Q. 3. When a student has to repeat a subject in order to qualify for the Ordinary Grade Certificate in Gas Engineering, may that be made an additional subject to those forming the first year of the Course for the Higher Grade Certificate?

A. Yes.

Q. 4. In the case of those candidates in the Higher Grade in Gas Engineering who obtained a Second Class, and wish to sit again to obtain a First Class, in order to qualify for the Diploma examination, is it necessary for them to attend class again, or may they sit without?

A. Same as to question 1.

Q. 5. Where a candidate has two qualifications, and the more recent is the lower of the two, which will be taken?

A. The higher of the two.

As no candidate is able now to take both gas engineering and gas supply in the same year, the two examinations have been fixed for the same day next year—namely, Saturday, May 1. All applications from external students must reach the Organizing Secretary by the last day of February.

FORTHCOMING ENGAGEMENTS.

Oct. 30.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Meeting at the Westminster Technical Institute.

Nov. 2.—SOCIETY OF ENGINEERS.—Meeting at the Geological Society, Burlington House, W., at 5.30. Paper by Mr. G. O. Case on "The Influence of Aggregates on the Strength and Properties of Concrete."

Nov. 4.—NORTHERN STAR LODGE.—Commemoration meeting.

Nov. 4.—INSTITUTION OF HEATING AND VENTILATING ENGINEERS.—Meeting at the Caxton Hall, Westminster, at 7 o'clock. Paper by Mr. J. J. Lassen on "The Modern Development of Combustion Recording."

Nov. 5.—GAS COMPANIES' PROTECTION ASSOCIATION.—Annual general meeting at Caxton Hall, Westminster, at 3 o'clock.

Nov. 7.—SCOTTISH JUNIOR GAS ASSOCIATION (EASTERN DISTRICT).—Joint meeting with Western District, at Glasgow.

Nov. 10.—CENTRAL EXECUTIVE BOARD OF THE NATIONAL GAS COUNCIL.—Meeting.

Nov. 10.—FEDERATION OF GAS EMPLOYERS.—Meeting.

Nov. 12.—SOCIETY OF BRITISH GAS INDUSTRIES.—Autumn general meeting at the Hotel Cecil, under the presidency of the Rt. Hon. Sir Alfred Mond, Bart., M.P.

Nov. 18.—SOUTHERN ASSOCIATION.—Meeting at the Hotel Cecil, Strand, W.C. 2, at 2.15 p.m.

Nov. 25.—EVENING STAR LODGE.—Meeting.

Nov. 26.—MIDLAND ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Autumn meeting at Birmingham.

Nov. 27.—NORTHERN STAR LODGE.—Regular meeting.

Dec. 5.—SCOTTISH JUNIOR GAS ASSOCIATION (EASTERN DISTRICT).—Visit to Alloa. Paper by Mr. W. Scott.

INSTITUTION OF GAS ENGINEERS.

Nov. 10.—4 p.m., Advisory Committee on Education.

Nov. 11.—11.30 a.m., Emergency Committee. 12.15 p.m., Benevolent Fund Committee of Management. 12.45 p.m., Finance Committee.

Nov. 25.—11 a.m., Institution's session at the Public Works, Roads, and Transport Congress, Royal Agricultural Hall, Islington.

Dec. 2.—Official visit to the Shipping Engineering and Machinery Exhibition at Olympia.

Dec. 8.—4 p.m., Advisory Committee on Education.

Dec. 9.—11.30 a.m., Emergency. 12.30 p.m., Finance.

CARBONIZATION PLANT OF THE MIDLAND COAL PRODUCTS, LTD.

Test by the Fuel Research Board.

The Fuel Research Board have published a report on the carbonization plant of the Midland Coal Products, Ltd., of Netherfield, Nottingham (H.M. Stationery Office, Adastral House, Kingsway, W.C. 2; price 9d. net). This plant is intended to utilize low-grade slack, which is briquetted before carbonizing. The retort, which strongly resembles a blast furnace in appearance, is internally heated by the combustion of part of the material undergoing carbonization. The following are the yields of products per ton of briquettes carbonized:

Coke	7·5 cwt.
Gas	58,300 c.ft., or 112·5 therms.
Tar	21 gallons.
Liquor	About 42 gallons (from assay).

The coked material, states the report, contains a remarkably small proportion of whole briquettes and a large proportion of breeze—the latter being of the order of 15 p.ct. The larger pieces—*i.e.*, ½-in. to 1½-in. and over—are very hard, and stand transport well. The coke contains about 2 p.ct. of volatile matter and about 13 p.ct. of ash. It is unsuitable for the ordinary open household grate, but is well suited for use in stoves. The tar is of a viscid nature containing small proportions of the lighter oils, a large fraction between 270° and 360° C., and about 63 p.ct. of pitch. The volume of gas produced is also large. The gas resembles a semi water gas made from bituminous coal, has a calorific value of 193 B.Th.U. per c.ft., and is the principal product of the process. The ammoniacal liquor is so diluted that ammonia recovery is commercially impossible.

The temperature of carbonization is of the order of 1200° C., but the briquettes are subjected to the action of the hot gas for about two hours before reaching the hot combustion zone. No appreciable amounts of unsaturated or saturated hydrocarbons other than methane were detected on analysis of the gas, which has the following average composition:

CO_2	1·6
O_2	*Nil*
CO	28·1
H_2	16·6
CH_4	4·4
N_2	49·3
Specific gravity (air = 1)	0·83

MICHAEL AND WILL—LAW RELATING TO WATER SUPPLY.*

Reviewed by a Barrister-at-Law.

THERE has recently been published Volume II. of the Seventh Edition of Michael and Will's well-known book on the law relating to gas and water. This volume relates to water, and like the companion volume relating to gas (which was reviewed in the "JOURNAL" for Oct. 1, 1924, p. 28), has been prepared by Mr. F. T. Villiers Bayly, Barrister-at-Law. After introducing his subject in an admirable and comprehensive introduction, Mr. Villiers Bayly has dealt with it in several parts. Part I. sets out the General Water Acts, with Statutory Rules and Orders relating to them; Part II. relates to the Metropolis Water Acts; Part III. relates to the various regulations in force for the prevention of waste; Part IV. relates to the question of preventing river pollution; Part V. deals with the powers of local authorities with reference to water supply; Part VI. relates to promotion of and opposition to Bills in Parliament by local authorities; and Part VII. deals with protection of property and of public authorities. It will be seen that the law relating to water supply is surveyed from every aspect.

The method employed by Mr. Bayly has been that followed in the previous editions, with which, no doubt, readers of the "JOURNAL" are familiar. It is to reproduce the text of the Acts, Orders, and Regulations, and, by means of full and careful notes, to direct attention to the interpretation placed upon these Acts by decisions of the Courts. The cases have been brought up to date. Although this volume relates to water, yet the sections of many of the General Acts are similar to the corresponding sections of the General Acts relating to gas supply, and for this reason one cannot overlook the decisions recorded and noted in this volume, when considering a particular point in relation to gas supply.

This volume is therefore a useful complement to the volume on gas, and as such will no doubt be appreciated not only by those having charge of combined gas and water undertakings, but also by those whose interest it is to keep touch with the law relating to the two cognate subjects of gas and water supply. The volume contains 737 pages, in addition to Tables of Statutes and Cases, and an Index, and is published at 55s.

* "Michael and Will on the Law Relating to Gas and Water." Seventh Edition. Vol. II.—Water, by F. T. Villiers Bayly, of the Middle Temple, Barrister-at-Law. 1925. London: Butterworth & Co.

CONFESSIONS OF A CAPITALIST.*

"We have a bad way, we English, of attributing our troubles to causes beyond our control. We are invited to believe that our unemployment, our bad trade, our low standard of living, are the direct outcome of the state of affairs in Russia and in other remote parts of the world. My suggestion is that a further understanding of these matters may lead us to appreciate that the main cause of the majority of our troubles is the modern mania for invoking public action, for taking money which would be productive and useful if left in private hands, and rendering it sterile and useless in the dead hand of the State machine." This concluding paragraph of Sir Ernest Benn's book indicates the lines upon which it is written. The author is an individualist, a firm believer in private enterprise; and the arguments which he puts forward are interwoven with the history of his life as a publisher. To many people—and, it is thought, rightly—greatest interest will attach to the chronicle of his work rather than to the proofs of a universally successful system which he endeavours to adduce from it. At the same time, if some of his arguments do not entirely convince, all of them certainly stimulate. Throughout, the book is forceful; it is written in the confident manner of a man who has worked hard and has achieved a measure of material success which falls to the lot of few.

Sir Ernest Benn speaks enthusiastically of the economic system in America, and the desire to work which the American workman exhibits. "If you were to offer the American workman an old age pension," he writes, "he would question your sanity or your honesty. His idea is to take the last farthing that is his out of the job when he does it, and then arrange the expenditure of that last farthing in his own way." To the author, America is as near to an economic heaven as we mortals shall ever approach. While the aim of the British workman—fostered by the trades unions—is to divide his job with another, the common ambition of the American is to be efficient, and, helped as far as possible by modern machinery, to increase his output. In this connection there comes to mind an article on our own coal problem which appeared recently in the "English Review." In this it was stated that in 1923, while the output per man-shift was 18 cwt., that in the United States was 80 cwt. This explains how it happens that United States miners have recently been earning wages averaging £8 per week, against the British average of £2 15s., yet the pithead cost of American coal is barely half as high as the cost of our material. And this is not due to neglect to provide labour-saving machinery in Great Britain. It is chiefly the result of mistaken trade unionism. The author of "The Confessions of a Capitalist" shows how in another sphere—that of a publishing house—the ca'canny policy of trade unionism has killed enterprise.

Sir Ernest Benn considers it absolutely unsound to share profits with a wage-earner. On the other hand, he is a wholehearted believer in the system of co-partnership, whereby the worker, by investing savings in the capital of the business in which he is working, himself becomes a "capitalist." Co-partnership is the keystone of America's commercial greatness. It is practised with increasing success in the gas industry here—increasing success from the workman's point of view, if not from that of the trades unions, who, indeed, regard it anything but amicably. Pareto's Law forms the subject of an interesting chapter in the book; but it must be confessed that this savours somewhat of Fascism. In argument it is clever, but it does not illuminate equally the two sides of the economic picture.

Enough has been said to indicate the virile character of the book. Certain distorted ideas—as the author stresses strongly in his introduction—can only be explained by the absence of such information as can be given alone by the business classes. Sir Ernest Benn has performed useful service in helping to fill the gap.

* "The Confessions of a Capitalist," by Sir E. J. P. Benn, Bart. Published by Hutchinson & Co.; price 18s. net.

Royal Society of Arts.—The programme of the Society for the 172nd session, which opens on Nov. 4, includes a course of three Cantor Lectures by Dr. R. Lessing, on "Coal Ash and Clean Coal." At meetings after Christmas a number of papers will be read—among them one by Dr. Margaret Fishenden on "Domestic Heating." There is also to be a lecture by Mr. W. F. Higgins, on "Thermometry."

Southern Association of Gas Engineers and Managers.—As announced in our "Forthcoming Engagements," a general meeting of this Association will be held on Wednesday, Nov. 18, at 2.15 p.m., at the Hotel Cecil, Strand, W.C. There will be discussion of the President's paper on the "New Gas-Works at Pitwines, Poole," read at the annual meeting, and a paper on "American Gas-Works Practice" is to be given by Mr. G. M. Gill. To celebrate the jubilee of the Association, a dinner will be held at the same hotel at 7.15 (reception 7 o'clock).

VOLUME, WEIGHT, AND OTHER PROPERTIES OF THE THERM.

By NORTON H. HUMPHRYS.

(*Concluded from p. 96.*)

Attention will now be directed to the properties of the therm as supplied to consumers, also to those relating to the combustibles separately, with further aid from the tables prepared by Mr. Harold E. Bloor and Dr. Percy F. Frankland, already turned to account for dealing with the incombustibles (*ante*, p. 96). The fundamental data are copied from the originals, and calculations based thereon are added. In Table VII. factors per c.ft. are extended to terms of therms. Cols. 11 and 16 show the volumes and weights as supplied, and 10, 15, 17, 18 refer to combustibles only. The bulks of their combustion products per c.ft. of gas (Col. 6) exhibit a close coincidence with the observed calorific values (3) and also in the " duty "—*i.e.*, the B.Th.U. produced per c.ft. of air consumed (5), which is for the most part close to 1·20. The small divergence is remarkable, in view of the various descriptions of gases included in the table, and may to some extent explain the similarity in the volume of the products generated by the formation of one therm (Col. 13), the majority being near to 1000 c.ft. A low quality gas may show advantage when gauged by the c.ft., but this entirely disappears under the standard of the therm. The products of combustion show a reduction coincident with fall in quality, but the figures in Col. 13 are, if anything, rather greater towards the base of the list than at the top.

The weight per c.ft. and the specific gravity range from 0·020 to 0·035 and from 0·26 to 0·45 respectively. The explanation of such variation is to be found in Table II., which sets forth the weights per therm of hydrogen, methane, carbon gas, and carbon monoxide; and by the different descriptions in Col. 2 of Table VII. The weight of the therm (incombustibles excluded) is dependent on the proportion of the latter, which is further elucidated in Table III. Mixtures A and C, consisting of hydrogen and carbon only, have a specific gravity of 0·2; but the effect when 25 p.ct. of carbon monoxide is introduced is to increase it to 0·4. Methane, having a specific gravity of 0·55, tends to increase the specific gravity of the combustibles in a slight degree. The effect is also noticeable in the weights of the combustible therms, Col. 18.

Dr. Frankland's table is extended in Table VIII. by the addition of three columns showing the volume of the therm, make per ton as furnished to the Board of Trade and published in the annual Parliamentary returns, and the yield of therms per ton of coal carbonized; which admit of comparison between the practice at important gas-works in 1884, with that obtaining at the present time. Dealing with the combustibles only, the calorific value was greater and the volume of the therm therefore smaller, at the earlier period; which is accounted for by the presence of more hydrocarbons and less carbon monoxide. The 17 English gases average less than 5 p.ct. of carbon monoxide, and 40 to 50 p.ct. of hydrocarbons, including methane. My late friend Mr. Thomas Settle was always strongly impressed with the value of the hydrocarbons; and one of the first investigations on the results of any of his numerous new departures from established carbonizing practice was directed to their proportions in the gas.

TABLE VIII.—*Dr. Percy F. Frankland's Analyses of Town Gases 1882-84, Cols. 1, 2, 3, 4. Cols. 5, 6, 7, Calculations based thereon.*

Place.	Reputed Candle Power.	Calculated C.V. B.Th.U.	P.Ct. Incombustible.	C.V. per C.Ft. Combustible. B.Th.U.	Volume Therm C.Ft.	Make per Ton Coal. C.Ft.*	Make per Ton. Therms.
Edinburgh .	30·0	834	95·01	877	114	9,860	..
Glasgow . . .	27·0	778	96·58	805	124	..	..
S. Andrews . .	27·0	782	93·96	832	120	..	..
Liverpool. . .	21·5	689	92·01	749	134	10,090	69·3
Preston . . .	20·0	690	94·12	733	136	10,070	68·9
Nottingham . .	18·5	686	96·44	713	140	10,200	70·5
Leeds . . .	18·0	736	95·27	762	131	9,140	66·3
Sheffield . . .	18·0	724	97·90	740	135	9,810	71·2
Birmingham .	17·25	638	88·04	726	138	9,770	62·3
Bristol . . .	17·0	666	94·62	703	142	9,200	61·3
Gas Light and Coke . . .	16·0	640	93·79	682	147	10,320	67·8
S. Metropolitan.	16·0	612	96·72	633	158	9,830	60·1
Redhill . . .	16·0	657	95·40	629	159	11,260	67·5
Gloucester . .	16·0	664	96·73	687	146	10,240	67·7
Newcastle-on-Tyne . . .	16·0	650	94·20	690	145	10,090	65·9
Newcastle-under-Lyme . . .	15·0	617	93·59	659	152	9,830	60·6
Brighton . . .	14·0	615	97·67	629	159	10,080	67·4
Southampton .	14·0	618	97·01	637	157	10,420	64·8
Ipswich . . .	14·0	625	88·98	713	140	9,180	62·0
Norwich . . .	14·0	616	96·56	638	157	10,440	64·2
Average of the 17 English companies . . .	..	660	94·65	697	145	..	..

* From the annual Parliamentary returns.

One would imagine that the changes introduced by the Gas Regulation Act, 1920, would lead to an increased yield of therms, possibly at the expense of the c.ft. per ton; but strange to say, when gas was sold by the c.ft. the volume per ton was on the average under 10,000, and the calorific value averaged 660 B.Th.U. as supplied, and 697 for combustibles only. The volume of the therm averaged 145. These figures compare favourably with Cols. 15 and 18 in Table VII. On the whole, the yield of therms per ton was quite equal to those stated in the returns for 1924. In two instances it exceeded 70, and in eight others 65. To-day, when there is no commercial advantage in high makes that do not show a corresponding increase of therms, there is a tendency towards phenomenal makes in c.ft. per ton.

The real criterion is the financial test, and unfortunately the alterations in the value of money preclude comparison on these

TABLE VII.—*Volume, Weight, and Air Complement of the Therm as Ordinarily Supplied. Cols. 1, 2, 3, 4, 6, 7, and 14 extracted from Mr Harold E. Bloor's appendixes—Transactions Institution of Gas Engineers, 1923-4, p. 558.*

No.	Description of Gas.	Obs. C.V. B.Th.U.	Additional Air Complt C.Ft.	B.Th.U. per C.Ft. Air.	Bulk of Combustion Products. C.Ft.	Calc. S.G. of Gas.	Weight of 1 C.Ft. in Lbs.	Weight of 1 C.Ft. of Combustibles Only. Lbs.	S.G. Combustibles Only.	Bulk of Therm as Supplied. C.Ft.	Bulk of Air Complement. C.Ft.	Bulk of Combustion Products. C.Ft.	P.Ct. Combustible.	Bulk Combustible. C.Ft. Lbs.	Weight of Therm as Supplied Lbs.	Weight Combustibles Only.	C.V. Combustibles Only. B.Th.U.
1	Hor. C.G.	562	4·88	1·15	5·60	0·40	0·031	0·020	0·26	178	869	997	92·1	164	5·52	4·46	610
2	C. Oven	560	4·84	1·16	5·56	0·43	0·033	0·022	0·29	179	866	995	89·1	159	5·91	4·46	628
3	C.G., C.W.G. . . .	539	4·50	1·20	5·25	0·49	0·038	0·027	0·35	186	837	976	83·4	155	7·07	4·47	646
4	" "	505	4·20	1·20	4·93	0·56	0·043	0·029	0·38	198	832	976	82·3	163	8·51	5·54	614
5	Hor. C.G., slight C.W.G.	500	4·23	1·18	4·96	0·48	0·037	0·026	0·34	200	846	992	83·9	168	7·40	4·70	596
6	C.G., 25 p.ct. C.W.G. .	497	4·26	1·17	4·95	0·41	0·031	0·020	0·26	201	856	995	91·2	183	6·23	4·71	547
7	C.G.	496	4·19	1·18	4·92	0·46	0·035	0·023	0·30	202	846	994	83·1	168	7·07	4·32	597
8	"	490	4·09	1·20	4·81	0·50	0·038	0·026	0·34	204	834	981	83·7	171	7·75	4·78	586
9	C.W.G.	490	2·12	1·19	4·80	0·64	0·049	0·037	0·48	204	840	979	87·1	178	10·00	7·52	563
10	C.G., B.G.	489	3·78	1·29	4·45	0·48	0·037	0·025	0·32	204	771	908	87·8	179	7·55	5·41	557
11	" C.W.G.	488	4·17	1·17	4·92	0·53	0·041	0·028	0·36	205	855	1086	80·4	165	8·40	4·06	607
12	Vert.,Oven,Hor.,C.W.G.	487	4·04	1·21	4·76	0·51	0·039	0·028	0·36	205	828	976	83·6	171	8·00	5·14	582
13	C.G., Prod. G. . . .	485	4·04	1·20	4·76	0·49	0·037	0·025	0·32	206	832	981	82·7	170	7·62	4·68	586
14	" "	483	4·24	1·14	4·98	0·51	0·039	0·027	0·35	207	878	1031	82·1	170	8·07	5·02	588
15	C.G., 25 p.ct. C.W.G. .	481	4·12	1·17	4·83	0·53	0·041	0·029	0·38	208	857	1005	85·2	177	8·53	5·78	565
16	C.G., C.W.G.	480	4·12	1·17	4·82	0·58	0·044	0·033	0·43	208	857	1003	85·6	178	9·15	6·58	561
17	C.G., Prod. G. . . .	479	4·01	1·20	4·74	0·48	0·037	0·026	0·34	209	838	991	82·1	173	7·74	4·64	583
18	C.G., C.W.G.	474	4·02	1·19	4·74	0·59	0·045	0·034	0·44	211	846	1000	82·5	173	9·50	6·31	574
19	Vert.C.G.,36p.ct.C.W.G.	441	3·48	1·27	4·14	0·50	0·038	0·026	0·34	227	790	940	86·6	196	8·63	6·03	509
20	Hor. C.G., C.W.G. . .	434	3·83	1·13	4·64	0·60	0·046	0·035	0·45	230	881	1067	67·9	156	10·58	4·57	639
21	" " Tully . .	429	3·59	1·20	4·28	0·50	0·038	0·026	0·34	233	840	997	83·2	194	8·85	5·29	515
22	C.G., 45 p.ct. C.W.G. .	412	3·50	1·18	4·25	0·62	0·048	0·035	0·45	243	842	1033	73·8	180	11·52	5·75	560
23	" 60 p.ct. " .	411	3·42	1·20	4·07	0·49	0·037	0·034	0·44	243	831	989	88·2	214	8·99	6·23	466
24	C.G., Tully	403	3·66	1·13	4·33	0·43	0·033	0·021	0·27	248	908	1070	88·1	218	7·99	6·31	457
25	B.G.	284	2·12	1·34	2·68	0·56	0·043	0·032	0·42	352	746	945	79·3	278	15·14	8·17	358
26	Tully	284	2·29	1·24	2·92	0·56	0·043	0·032	0·42	352	806	899	87·6	308	15·14	11·10	324
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)

C.G. = Coal gas. B.G. = Blue gas. C.W.G. = Carburetted water gas. Prod. G. = Producer gas. Hor. = Horizontal retort. Vert. = Vertical retort. C. oven = Coke oven.

lines. The tendency has been in the direction of lower qualities, to the benefit of all parties concerned. Much of the coal now supplied would have been refused by our predecessors in 1884; but against this there is the general use of steaming in the retort or of separate water gas plant. The Board of Trade Gas Undertakings Return for 1924 states that, out of some 253,000 million c.ft. of gas produced in England and Wales by statutory companies, 38,000 millions consisted of water gas; in 1884, the cupola system is not recognized by a separate return, and the presumption that the bulk of the supply was straight coal gas is reasonable. To get a fair comparison, the present-day 15,000 to 20,000 make per ton must be stripped, first, of the percentage of incombustibles, and, secondly, of the additions due to steam or other extraneous matter. There is room for a clear distinction between the make of gas by direct retort distillation, and the same including that obtained by the addition of steam or oil. Not overlooking the fact that much has been done in the way of reducing consumption of furnace fuel, wages, and other costs of carbonization, so far as the chemical balance-sheet is concerned, comparisons do not reveal any special improvement.

The calorific value of the heavy hydrocarbons may be anything between 5 and 10 times as much as a corresponding bulk of hydrogen, and therefore contribute as much as 20 p.ct. of the total calorific value supplied. They are not to be passed over as insignificant, and some further insight into the effect of various methods, and temperatures of carbonization, both on quality and quantity of products would be advantageous. Some may suppose that, with the entrance of the therm in place of the candle, the hydrocarbons which were formerly the source of candle-power are now of no importance; losing sight of the fact that they contribute not only to a luminous flame, but also to the calorific value.

So far as direct retort distillation of coal is concerned, oxygen might be counted as worse than an incombustible. It does not contribute anything in itself, but combines with hydrogen or carbon to form water or carbon oxides, and the removal from the gas of combustibles in any form means a loss of therms. We have seen that the formation of carbon monoxide is not advantageous from a thermal point of view. Some second-rate gas coals contain as much as 10 p.ct. (224 lbs.) of oxygen to the ton—a quantity which, if entirely converted into carbon monoxide, would yield 392 lbs., equivalent to 5410 c.ft. or 27 p.ct. on a make of 20,000 c.ft. per ton of coal carbonized. Yet not more than one-third of this bulk can be obtained in practice, without the addition of more oxygen in the form of steam or air. We have seen that the price obtained for therms in the form of coke is but a small fraction of the standard, when sold as gas. Therefore attention may be directed both to retention of oxygen in the gas, and to its use as a means of gasifying carbon, so as to produce the maximum of carbon monoxide that circumstances will permit. Not only must the composition of the gas be considered, but also the effect on the ash content of the coke, by the abstraction of pure carbon.

Something has been said lately about internal combustion in the retort; but, if allowed, it should be restricted to carbon only. Hydrogen is too valuable to lose, and the formation of water other than that mechanically retained by the coal indicates burnt hydrogen. The large yields of carbon dioxide, already referred to, are simply carbon combustion products.

The tables utilized in the foregoing investigations have been selected, as being best suited to the purpose, from a large number of similar details covering nearly all the authentic information published within the last five years. The conclusions arrived at are nothing more than the crude ideas of a practical engineer, and as such have no claim to scientific authority or accuracy. The fundamental data are slightly uncertain, which has led to a suggestion in another place (see "Journal" for Aug. 11, p. 387) that standard tables of volumes, weights, specific gravities, calorific values, &c., should be issued by the Research Committee of the Institution of Gas Engineers or other recognized authority, and adopted as a standard by gas engineers generally, thus furnishing a common basis for practical investigations. They would occupy a similar position to that accorded to the model form of accounts attached to the Gas-Works Clauses Act, 1871, in connection with the preparation of annual statements for issue to the shareholders.

A critic may object to lack of practical point, and urge that in these times there is not much room for pure theory or idealism; but the object has been to suggest that the several attributes of the combustible constituents of town gas are worthy of careful and complete investigation, as a means of arriving at the cheapest and the most efficient therm. Hope is expressed that others more qualified, and having better facilities, may be led to study the volume and weight of the therm, the possibility of putting more hydrogen and hydrocarbons, and less carbon dioxide, into the gas, on lines wider than those afforded by practical methods of working, and other cogent matters that have been mentioned in passing.

Practical men may consider the cost of distributing nitrogen (specific gravity 0·97), oxygen (1·12), and carbon dioxide (1·53), including interest on outlay, maintenance, and depreciation of plant, and the cost of attending to complaints, clearing obstructions, changing and repairing meters, &c.

ALLEN'S COMMERCIAL ORGANIC ANALYSIS,* VOL. 3.

Reviewed by A. Parker, D.Sc., F.I.C.

This volume follows very closely the ground covered by the corresponding one of the previous edition published in 1910. While there is but little alteration in its scope, there have been several changes in the personnel of the contributors and an increase in size of approximately 100 pages. The part on "Benzole and its Homologues," which was formerly included in the section on Bitumens, has been transferred. According to the preface, this subject has grown so considerably during the last few years that it was deemed preferable to treat it separately along with "Dye Intermediates and Dyes," in what, doubtless, will be Volume VI.

In the section on the testing and analysis of tars, pitches, and oils, the methods of the United States Bureau of Mines and the American Society for Testing Materials have been generally followed, though an ample account is also given of the specifications and methods of analysis of tars for road-making purposes as drawn up by the Ministry of Transport (Roads Department) of Great Britain.

The complex nature and difficulties of analysis of commercial hydrocarbon products are wisely emphasized in the first section of the volume. It is pointed out that nearly all commercial hydrocarbon products, unless highly refined, contain members of different series. Thus petroleum oils from practically any source contain, besides aliphatic or naphthene (polymethylene) hydrocarbons, benzene homologues, sometimes as much as 40 p.ct. Although the fact of hydrocarbons of different types frequently appearing together seems to justify a *primâ facie* case for a systematic series of tests, no such scheme of general applicability has yet been devised. The kind of reagents employed and the sequence of operations must vary according to circumstances.

In the paragraphs devoted to gas oil, the reader is reminded of the formula, B.Th.U. = 18,650 + 40 (Baumé degrees − 10), designed to express a relationship stated to exist between the calorific values in B.Th.U. per lb. and the specific gravities in Baumé degrees of petroleum oils. Sherman and Kropff (J. Amer. Chem. Soc., 1918, 30, 1621) examined sixty-four samples of typical American petroleum oils, and found close agreement between the calorific values as determined by experiment and as calculated from the gravities. The reviewer has applied the Sherman and Kropff formula to calculate the calorific values of the gas oils used in the experiments described in the Seventh Report of the Gas Investigation Committee of the Institution of Gas Engineers; the values calculated by this method differed from the determined values by less than 0·5 p.ct.

The section on "Phenols" includes much new work; and practical analytical methods for separating isomeric cresols and cresols from phenol are given. The Rydeal-Walker and Hygienic Laboratory methods for determining the phenol coefficient of antiseptics, by means of B-typhosus, are described in detail.

In an article on "Phthalic Acids," the subject of indicators is discussed, and the newer indicators for hydrogen ion control are considered.

The inclusion of a bibliography at the end of each section is a useful addition to the new volume. An improvement might be made by simplifying a number of the figures given; for example, the figure (p. 84) of the Engler distillation apparatus would be clearer in the form of a simple line diagram. A large number of slips appear to have escaped the proof-reader, especially in the chemical formulæ and equations—*e.g.*, the equation for methane and oxygen on p. 8, cellulose trinitrate on p. 598, and the equation explaining the determination of nitro groups (p. 623). In spite of these defects, the editors and contributors are certainly to be congratulated on having maintained the high standard of the previous edition in bringing it up to date.

* **Hydrocarbons, Bitumens, Naphthalene and its Derivatives, Anthracene and its Associates, Phenols, Aromatic Acids, Gallic Acid and its Allies, Phthalic Acid and the Phthaleins, Modern Explosives. Fifth edition, revised and partly re-written. Edited by Samuel S. Sadler, Dr. Elbert C. Lathrop, and C. Ainsworth Mitchell. Pp. ix. and 732. Published by J. and A. Churchill (1925). Price 30s. net.**

Society of British Gas Industries.—At the autumn general meeting, which is to take place at 2.30 on Thursday, Nov. 12, in the Hotel Cecil, under the Presidency of the Right Hon. Sir Alfred Mond, Bart., M.P., there will (we learn from the Secretary, Mr. Arthur L. Griffith) be a paper on "Co-operation in Industry," by Mr. B. B. Waller, Assoc.M.Inst.C.E. Mr. Waller will, in addition to this, give the customary interesting short account of the Society's work during the past six months.

"B.C.G.A." CONFERENCE AT PLYMOUTH.

On the first three days of last week, some hundreds of representatives of all branches of the gas industry, from every part of the country, were assembled in Plymouth to take part in the Fourteenth Annual General Meeting and Conference of the British Commercial Gas Association, and to do honour to the President, Mr. J. H. Ellis, the Chairman of the Plymouth and Stonehouse Gas Light and Coke Company. In addition to being largely attended, the sessions were full of interest, and the conference was a success in every way—such a success as the President had fully merited by reason of his untiring efforts on behalf of the Association and his good work for the gas industry as a whole. In looking after the welfare of the visitors, he was ably seconded by Mr. Percy S. Hoyte, the Company's Engineer, and by Mr. George H. Bolton, the Secretary; while the arrangements for the meetings had been made with customary thoroughness by Mr. W. M. Mason (Manager), Mrs. Cloudesley Brereton, Mr. J. C. Walker (Secretary), and other officers of the Association. Among those attending were Mr. D. Milne Watson and Mr. W. J. Smith (President and Secretary of the National Gas Council), Mr. C. F. Botley and Mr. Walter T. Dunn (President and Secretary of the Institution of Gas Engineers), Mr. B. B. Waller (Chairman of Council of the Society of British Gas Industries), M. Mougin (Secretary of the Société Technique de l'Industrie du Gaz en France), and M. Simor Saint Just (Propaganda Director to the Paris Gas Company).

A Reception.

The proceedings opened on Monday evening, Oct. 19, with a reception at the Guildhall, by the Mayor and Mayoress of Plymouth (Alderman and Mrs. R. W. Winnicott). This proved an extremely pleasant function. The guests numbered about 350, and all listened with close attention to the lantern lecture on "Sunlight and Health" delivered by Dr. C. W. Saleeby, F.R.S. (Edin.). There was also a most enjoyable programme of music performed by a portion of the string band of H.M. Royal Marines (by kind permission of Col. Commandant F. C. Edwards). Light refreshments were served.

The chair during the lecture was occupied by Mr. Ellis, who called upon the Right Worshipful the Mayor to introduce Dr. Saleeby to the audience. The Mayor, in response, remarked that no words of his were required to introduce Dr. Saleeby—his fame had gone before him.

SUNLIGHT AND HEALTH.

Dr. Saleeby, who was very cordially received, began his lecture with a protest against our procrastination and inaction in the matter of smoke abatement. Half-a-century had passed, he said, since the futile attempt of the otherwise great Public Health Act of 1875 to deal with our coal smoke, and no new legislation had been achieved. A promise from Mr. Neville Chamberlain was welcome, but what the future offered us could not save either us or our children this winter from the diseases of darkness—the "skiapathies," to use a more impressive word. But could we clean our skies? The country must have a stream of power, from some source or another, flowing through it for its life. If only we had white coal, and could generate hydro-electricity, all would be well; but we had no Niagara, nor could we contrive to plant such waterfalls at suitable places through the country. For us it was coal or nothing. Dependent upon coal as we were, how could we escape the smoke which resulted from burning it? The true answer was by ceasing to burn it—by resolving it, in fact, by the process of carbonization, into other fuels and all the chemicals that coal yielded us. Inventors had tried to solve this problem in terms of burning coal; but, valuable as such devices admittedly were in some cases, there was no real and ultimate solution in automatic stokers, powdered coal, or apparatus designed for catching and consuming smoke.

Speaking of legislation, Dr. Saleeby said there had been nothing but a few trifles in Lord Onslow's Bill for Smoke Abatement prepared for a recent Parliament; and there would be little more in the Bill promised for next year by Mr. Chamberlain. Of course, one must be thankful for small mercies. By all means, delete the qualifying adjective "black," which was applied to the prohibited smoke in the Act of 1875, and had cost many lives ever since. Let us also enlarge the administrative areas, as Lord Newton's Committee recommended, so that the chief offender might not also be the chief magistrate and the appointer of the local inspector. But these were details. What was wanted was more than a merely negative policy—more than a Bill which assumed and accepted the burning of raw coal, and did not even pretend to touch the resultant problem in the domestic chimney. This last was a serious omission. The domestic chimney was worse than the industrial chimney. It produced far more than half of the smoke which polluted the urban atmosphere, and, being the result of burning coal at lower temperatures, emitted a much more objectionable kind of smoke. There was only one real remedy—to stop burning coal, and distil it instead, like intelligent beings.

The Ministry of Health, local authorities, and the public at large continued to acquiesce in a policy whereby we wasted most of the energy in our coal, destroyed our sunlight, spread the disease of darkness, and corroded our noblest national monuments through the sulphur in the coal. Fixed nitrogen should be extracted from the coal by distillation, and used as a fertilizer for the soil, to grow fresh food for the ill-fed and miserable urban populations. The energy in coal, which could give up our light, heat, and power, was the stored-up energy of sunlight in past ages; and we were using the sunlight of past ages to shut-out the sunlight of our own age. We were being asked for half-a-million pounds to restore Westminster Abbey—the very sum which formed an extra annual tax on the people of Manchester for laundry bills alone as part of the price for their smoke. Small wonder that the specialist consulted by a Cabinet Minister as to whether an important engagement could be taken in his state of health, and learning that it was in that famous city, replied: "Certainly not, no one is well enough to go to Manchester." A great contrast was presented by Plymouth, where the atmosphere was so much clearer. Perhaps this was because so great a proportion of the housewives had installed gas cookers.

Some industries would complain that they could not carry on without burning coal and making smoke. But this was false. He had seen it for himself in a recent visit to the Rhineland, where the Germans made everything our cities made, except the smoke—and rickets.

Mr. Ellis said he would like to thank the Mayor very heartily for having given them the opportunity of listening to Dr. Saleeby in circumstances of such extreme comfort. Dr. Saleeby was a great lecturer and a great pioneer, and had alluded to sunlight cures farther afield; but had they not a chance nearer home of doing the same thing, or of even going one better? He thought they had, because he had noticed quite lately an extract from the report of the Borough Meteorologist, in which he showed that Plymouth stood third in the list of towns in this country in point of sunlight for the current year—being beaten only by Falmouth and Torquay. By the exertions of the great Corporation over which the Mayor presided, and by all pulling together, they should try to make Plymouth the sunniest town in the country, and one in which such institutions as those to which Dr. Saleeby had referred might well be established.

The Mayor remarked that they had listened to an admirable lecture, the whole tenor of which had been: "Come to Plymouth and live in the sunshine." He proposed a hearty vote of thanks to Dr. Saleeby.

Mr. Milne Watson, in seconding, said that he had greatly enjoyed the lecture.

A Welcome.

The business meetings were held in the Assembly Rooms of the Royal Hotel; and at the opening of the proceedings on Tuesday morning, the President at once called upon the Mayor.

The Mayor said that this was the first time Plymouth had been honoured by a visit from that distinguished organization; and he was taking the earliest opportunity of saying how much the visit was appreciated, and of offering them a most cordial welcome. He was sure his colleagues on the Council and the people of Plymouth agreed with him in extending to the members a right hearty Devonshire welcome. Plymouth had a history of which any town might well be proud. It was claimed that Plymouth was the first Municipal Corporation granted by Act of Parliament; and looking back at the long line of Mayors from 1439 who had occupied the position which he had now the honour to hold, he thought they would agree with him that the list contained many distinguished and glorious names. There were Drake and Hawkins and a host of others who had served not only their town but their country as well. He believed the town was indebted to the President for the presence of the Association in Plymouth; and those who had been associated with him in public life knew Mr. Ellis's worth and the high esteem in which he was held throughout the borough. Mr. Ellis had given Plymouth many years of wonderful service as Town Clerk; and the town had recognized his great services by conferring upon him the highest honour it could confer, by making him a Freeman of the Borough. He was certainly a worthy successor to those who had occupied the position of President of the Association in previous years, and his

name would ever be associated with the development and rapid growth of Plymouth. He saw that the meeting would be discussing problems the solution of which must make for the welfare of the people and the commercial prosperity of the country. An Association such as that without doubt performed a most important function as a clearing house for discussing new ideas and new methods. Plymouth, he ventured to say, occupied a position in the forefront of the gas undertakings; and the members would doubtless take the opportunity of visiting the gas-works and seeing for themselves the up-to-date methods and the excellent organization there in evidence. It was a great pleasure to him as Mayor to be of any service he could to the Association; and he hoped that at some future date they would again visit Plymouth.

The President said that, on behalf of the Association, he wished to thank the Mayor very heartily for his hospitality on the previous evening, and for his cordial welcome that morning. He hoped all present would visit the gas-works, when Mr. Hoyte would be delighted to entertain them.

Presidential Address.

The President then proceeded to deliver his address, which was published on p. 167 of last week's "Journal."

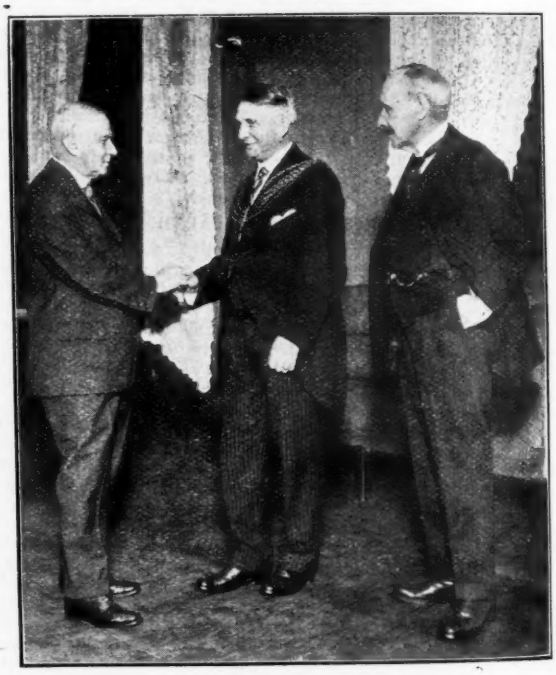
The Government and Electricity.

Mr. D. Milne Watson said it was with very great pleasure indeed that he rose to move that a hearty vote of thanks be given to Mr. Ellis for his able and instructive address. He had risen to the occasion, just as they would have expected him to do. They knew Mr. Ellis in many capacities, both in the gas industry and outside it. He had filled important posi-

THE PRESIDENT, MR. JOHN HENRY ELLIS,
Chairman of the Plymouth and Stonehouse Gas Light and Coke Company.

Born in 1855, and educated at Steyning and Brighton, Mr. Ellis became a solicitor in 1877. In 1891 he was appointed Town Clerk of Plymouth and also Clerk of the Peace for the Borough. The latter office he still holds. When he went to Plymouth it was a borough of 1479 acres with a population of 84,000. During the strenuous years of his office he conducted the case for the enlargement of the borough by the inclusion of Devonport and Stonehouse. The amalgamation took place in 1914; and Mr. Ellis was requested to continue as Town Clerk of the extended borough (now a town of 6075 acres with a population of nearly 215,000) to get the new administration into working order. During his years of office, Mr. Ellis pushed through—sometimes against strong opposition—far-sighted schemes for water-supply, sewage disposal, tramways, and extensive general public improvements; and when he retired from the Town Clerkship in 1917, he was made, in recognition of his great services, the first Honorary Freeman of the borough, and appointed Honorary Consulting Town Clerk. His retirement has not, therefore, meant his official severance from the borough. Held in affectionate regard throughout Devon, he is trusted by all classes alike; and his knowledge and experience of public affairs is still at the service of the industries and public undertakings of Plymouth.

tions, with great honour to himself and great benefit to the enterprises and municipalities with which he had been connected; and it was a very fortunate thing for the British Commercial Gas Association to have had during this most strenuous year such a man as Mr. Ellis at their head. They had had from him a most carefully thought-out explanation of the position of the gas industry *vis-a-vis* the great questions which were at the moment surging around them—electricity, low-temperature carbonization, tar, coal, and other matters. He was sure they all felt extremely grateful to the President for the illuminating way in which he had dealt with these subjects. He had given them much food for thought. There never was a time when the work of the Association was more necessary than to-day. ["Hear, hear."] They never as an industry had felt competition so keenly as they were doing now; and he was sure they would all agree that it was no use their chemists and engineers experimenting and carrying out research work, and undertakings spending vast sums of money, unless at the other end there was a commercial body to sell the product, persuade people to use it, and ensure a satisfactory service. This was what the Association had set out to do, and what they had accomplished so successfully. Of course, without research work in the laboratories and the efforts on the works, they could not possibly deliver the goods; but after the commodity was made, it was absolutely necessary that the commercial side should not be wanting, and this side the Association admirably represented. Therefore he would endorse what the President had said, and ask all those who stood outside their ranks to close in, and make the ranks absolutely solid, to carry on this great work at the present time. Perhaps he might be excused if he said one or two words upon vital questions the President had referred to. As had been said, there were proposals which had not yet seen the light of day with regard to electricity—Government proposals—and there were also matters with regard to low-temperature carbonization. Now, when he wanted to find out the position on any particular matter, he usually turned to what had been said by an expert on the other



The President welcomed by the Mayor of Plymouth. Mr. H. Wade Deacon on the right.

side; and he had in his hands a most valuable article which he had just cut from a daily paper issued that week. It was called "Electrical Policy—a National Issue." Therefore one might expect to find in it exactly what the electricians thought of the position to-day. As he had been careful to point out in previous addresses, they in the gas industry were not hostile to electricity. Many of them used it on their works; and they had nothing but admiration for the great work which electricity had done in the past, and no doubt would do in the future. But what they were really up against was undue preference on the part of the Government. [Applause.] They had been told so often that there was no question of a subsidy, and at the moment he did not propose to deal with it at all. This might be left until the Government proposals were brought out next spring. They, however, still had their grouse—namely, that there was constant Government advertising of electricity. One would really think that gas had done nothing to clear the air of the cities. They had speeches in all directions in which it was claimed that the advent of electricity would clear the cities of smoke. No doubt it would help to do it; but gas had done the same, and was still doing it, in a way that it was very questionable whether electricity would be able to do in the future—not because electricity was not smokeless in use, but because it was too dear for the average ordinary consumer to use as a fuel, and gas was the only smokeless fuel that such a consumer could afford. Therefore the Government ought to stimulate in every way possible the use of gas. The gas in-

dustry did not want their money, but they did want their encouragement, in order that the public might be induced to use gas. At any rate, they certainly ought not to advertise electricity alone. Now in the paper to which he had alluded there was what electricians apparently considered to be their programme; and it contained some of the most extraordinary remarks. It said practically that the question of the scientific utilization of our coal resources depended after all on a com-

Mr. P. S. HOYTE,

[Engineer and Manager of the Plymouth and Stonehouse Gas Light and Coke Company.

bination of intensive electrification and low-temperature carbonization. These were the points that needed to be dealt with. Electricity had its uses, but so had gas; and gas was a far greater conserver of fuel than electricity. More heat units were delivered to the consumer in the form of gas than of electricity. Therefore it was the better fuel; but his electrical friend did not worry about this. He said:

> The time for coal conservation will come when we are within an appreciable distance of exhaustion of our coal reserves, and this will mean several centuries. What is required is some method of coal utilization which, while retaining the present output, will give to it a higher market value. It is not so much conservation as effective utilization that is required; and our existing methods of high-temperature carbonization are not calculated to do this.

If this was really the considered opinion of the electrical industry, it was a most amazing statement, because, after all was said and done, efficient utilization was coal conservation. One could not get away from this. To say that high-temperature carbonization was not calculated to secure effective utilization was astounding; and yet this was what they were up against.

Low-Temperature Carbonization.

Continuing, Mr. Milne Watson remarked that, with regard to low-temperature carbonization, the writer went on to say:

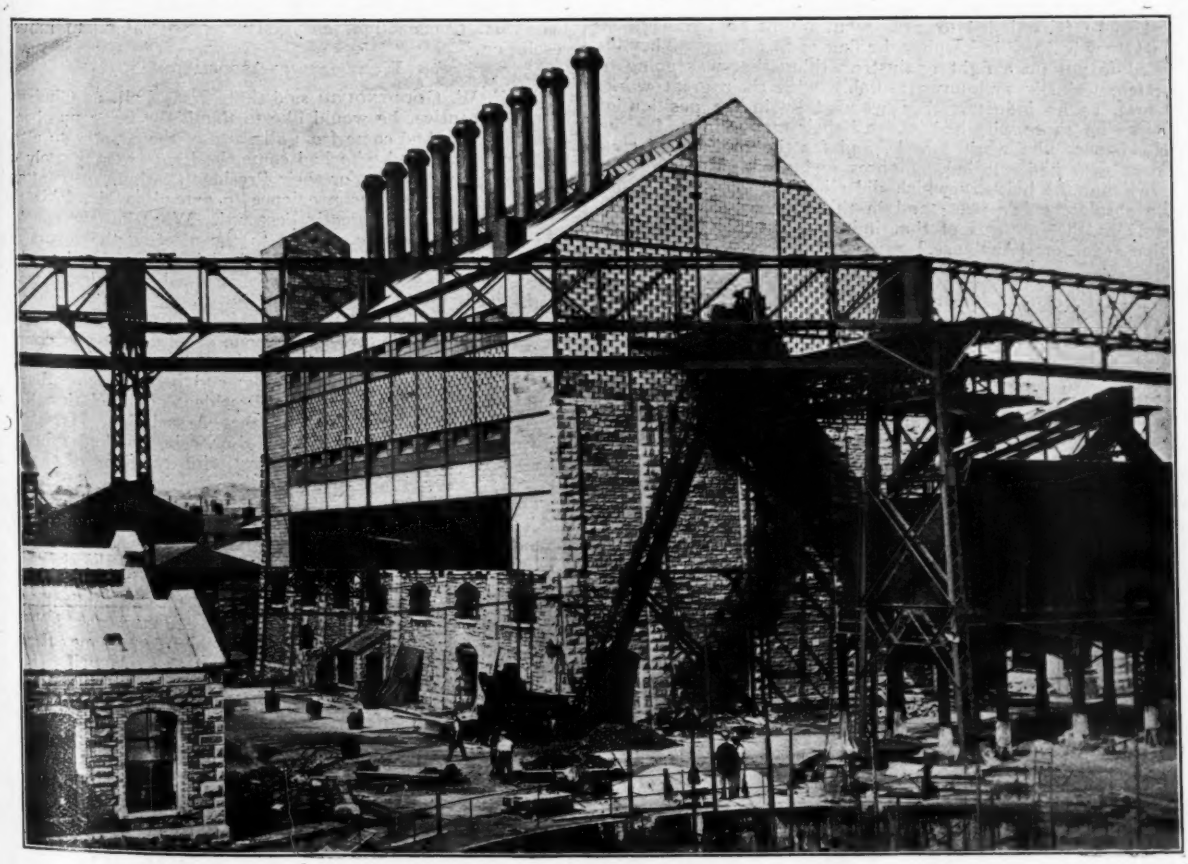
> The ideal is to resolve coal as mined, even from the very lowest grades, into products that can be entirely used without surplus—through better methods of combustion of coal (which is at present thrown on the spoil heaps) for steam raising in electrical power stations, and through carbonization of good coal by some method which will obtain the minimum of gas and the maximum of products which can be stored and placed directly on the market—oil, chemicals, fertilizers, dyes, and coke.

It left one perfectly staggered if this was the idea of the electrical industry of a national programme—that one was to treat the coal to get as little gas as possible. The writer also said, in other words, that research had gone quite far enough with regard to low-temperature carbonization.

> The alternative between the adoption of a bold national policy and the relegation of the matter at issue to further and generally unnecessary research is simply the alternative between enterprise and inefficiency.

In effect, what he said was that low-temperature carbonization had proved so successful that all that was wanted was a bold policy, and the doing away with research. He had in his hand a copy of the report of the Committee of the Privy Council on Scientific and Industrial Research for the year 1924-25. This was a body appointed by His Majesty's Government, and also paid by His Majesty's Government. What did they say?

> To those, like ourselves, who for eight years past have been pressing forward towards the solution of this urgent but difficult problem, the awakened public interest in the question is very welcome, but we recognize, and the public should realize, that it is not susceptible of a single simple answer, or, even after all the work that has already been done, of a rapid solution. Both we and the Fuel Research Board have repeatedly pointed this out in past reports, and full reasons for this opinion have been stated. But now that the importance of the problem is widely appreciated it is more than ever necessary to give this warning. Hasty steps and ill-considered attempts at rapid action at the cost of public funds will inevitably lead to a repetition of the past disappointments of enthusiastic private workers in this field on a



GLOVER-WEST VERTICALS AT PLYMOUTH.

> still larger scale, and with far more serious effects on the prospects of what may now be described as a promising line of investigation. The national interests involved make it most desirable that all the facts, not only of the experiments of the Fuel Research Station, but so far as possible the results of private endeavours, should be made available and compared in a manner which will help to create an enlightened public judgment and to guide private investigators along the most promising lines of advance. Accordingly, we recommend Your Lordships to empower the Department to test without charge any promising full scale plant which its owners would place at the disposal of the Fuel Research Staff for the purpose, and to publish the results. We should explain that the Department confines its attention to the technical performance of the plant tested, and can make no attempt at estimating its commercial possibilities. No sound opinion can be formed on this aspect of the case without a prolonged trial extending over some two or three years, under scientific control and under efficient management assisted by qualified accountants. Such trials would undoubtedly be most useful.

Now, which view was the correct one? He unhesitatingly said the view expressed in the report of the Committee of the Privy Council; and he did hope that the Government and those who were responsible for public opinion would take heed of this, because it would be seen, from what he had been quoting as the national policy for the electrical industry, that they held entirely contrary opinions. Unfortunately, popular imagination had been struck, and vast masses of their fellow citizens really believed that electricity and low-temperature carbonization were going to save the country.

What is Objected to.

Pursuing his subject, Mr. Milne Watson declared that whatever advances could be made in electricity and low-temperature carbonization would be gain. The gas industry had nothing against electricity. What they objected to was that it should be boosted and encouraged by the State at their expense. With regard to low-temperature carbonization, the gas industry had investigated it, were investigating it, and would continue to investigate it. If it could be proved possible, and it was to the advantage of the gas industry and the consumers of gas in this country, and if it could be made a commercial success, the gas industry would welcome it with both hands, and immediately adopt it. But the gas industry were not going to take up a thing which the Fuel Research Board had said was only in the experimental stage, merely because some enthusiasts clamoured for low-temperature carbonization. When low-temperature carbonization had been proved by Government experts and by the gas industry to be possible, then the gas industry would take it up without any delay at all. On this point, the country might rest perfectly satisfied. In conclusion, he would say that the attitude of the gas industry towards these questions was that, while they desired to be fair-minded towards what might be termed their rivals, they believed in keeping the flag of gas flying. They intended to put up a fight against anything that was going to interfere unjustly and unwarrantably with their great work, because, as an industry, they were really in the position of trustees for those who had invested their money in it, for the 100,000 men who worked in it, and for the millions of consumers who had put in appliances and used gas. They intended that the industry which did all this great work should have absolutely fair play; and in this they were looking not merely to the interests of that industry, but to those of the nation at large. [Applause.]

Plymouth's Cheap Gas Supply.

Mr. C. F. Botley, in seconding the motion, remarked that there was very little left that he could usefully add to what Mr. Milne Watson had already said. He most heartily associated himself with the appreciation that had been expressed of the address they had had from the President. It appeared to him that the address was most opportune at the present time. There were in it logical arguments to combat the arguments which were put forward by interested parties—because he supposed it was quite fair to say to-day that really the impetus which was being given to the electricity propaganda came from those interested particularly in the production of plant and apparatus connected with the industry. Arguments were needed to combat these very plausible tales which had seized upon the imagination of the public. He would like to call attention to one aspect of the electricity question which seemed to him to be very dangerous. They had heard the tale of the gentleman who got into a jaunting car in Ireland before he had announced his destination; this undoubtedly was the position of the Government at the present time. They were looking out for some means to stimulate or revive the trade of the country. Unemployment, although it represented under 10 p.ct. of the would-be employed people in the country, was a very awkward difficulty for any Government, and a very serious matter for the country; and if the Government thought there was anything in this business of electrification, it was perhaps only natural that they should desire to adopt it. But those who had looked at the matter more seriously could not see that it was going to be of any use in the long run. It might temporarily stimulate certain classes of employment; but he could not see that it was going to have the effect of permanently employing those people who were now unemployed. Supposing that the Government did adopt the policy of electrification, and got landed in some tremendous scheme. The gas industry felt it would fail; and what was going to be the position then? Very serious, he believed. Supposing they took electricity into the rural areas, people would not use it. Many people did not want it, and many others could not possibly afford it. If electricity was taken to them for nothing, it would be useless without the necessary appliances; and if people had electricity forced upon them, the next thing would be that appliances would have to be supplied to them for utilizing it. This was a very dangerous matter. As to low-temperature carbonization, he emphatically endorsed what Mr. Milne Watson had said—that if it was going to help the consumers (for whom, after all, the industry existed), then the gas industry would adopt it. They only wanted to be satisfied that it was the right thing. He would also like to testify, while they were gathered together in Plymouth, to the great service that the town rendered to the gas industry, by reason of its cheap and good supply of gas. Plymouth, as long as he remembered, had always been associated with one of the cheapest supplies of gas in the country; and this was a great help to them all. People were able to make wide use of appliances because the gas was cheap. If their industry was to hold its own, they must keep their house in order. They must have before them the ideals to which the President had referred, and give the best possible service to the public.

Mr. B. B. Waller supported the resolution on behalf of the Society of British Gas Industries. The aims, interests, and objects of the "B.C.G.A." and of the "S.B.G.I." were, he pointed out, identical.

Mr. F. W. Goodenough remarked that, at much personal inconvenience, their good friend and Past-President, Mr. Wade Deacon, had come to attend the meeting, and they would like to hear a few words from him.

Mr. H. Wade Deacon said it afforded him very great pleasure to be with them, in order to return the compliment which the present President paid him by going to Liverpool last year. He agreed with what Mr. Milne Watson had stated regarding low-temperature carbonization. If it could be made a commercial success, the gas industry would adopt it; there was no doubt about that. They were not afraid of it; but at the moment they were not satisfied that it was the proper policy to adopt it.

Mr. Milne Watson then put the vote of thanks to the meeting; and it was carried with acclamation.

The President expressed his gratitude to the members for the warmth of their reception. He thanked those who had spoken so kindly of him, and especially his friend and immediate predecessor in office, Mr. Wade Deacon, who had come from Lancashire to help them by his presence. He then called upon Mr. Goodenough, as Executive Chairman, to move a resolution.

Work of the Association.

Mr. F. W. Goodenough said that, first of all, as Chairman of the Executive, he would like to thank the large number of members who had come from all parts of the country to attend the conference, and who had come, he knew, very largely out of respect and esteem for their President. Many were attending at considerable inconvenience to extend to Mr. Ellis that support which he so greatly deserved. What he (the speaker) had now to do was to present to the meeting the report and accounts for the past year. They had been circulated, and no doubt would be taken as read. He assumed, also, that it would be the wish of the meeting that he should not take up time by going over past history; but he would like, within the time-limit at his disposal, to say one or two things in connection with the work of the Association. The President had referred to the value of team work; and in this connection he would like to allude to what the President of the National Gas Council and Past-President of that Association, Mr. Milne Watson, had said recently at a dinner in London, when he spoke in terms that were very gratifying to many of them of the team work that was done for the industry by all the organizations in support of him (Mr. Milne Watson) as head of the National Gas Council. He would like to say, in reference to this, that it was very easy to do good team work, when the team was led by one who displayed all the characteristics of a team leader, in the way that Mr. Milne Watson did. ["Hear, hear."] There was talk of the nationalization of industry. The only nationalization that the gas industry wanted was the nationalization they had by means of their organizations, headed by the National Gas Council. If he might be allowed to say so before him, he would like to bear testimony from personal knowledge—as many of those present knew, he had other experience of Mr. Milne Watson than as President of the National Gas Council; he had other opportunities of observing his work [Laughter]—and he knew that, in his position as President of the National Gas Council, he always considered the general interests of the industry as distinct from the particular interests of the great undertaking over which he presided as Governor. He had known more than one occasion on which Mr. Milne Watson had subordinated the apparent immediate interest of his Com-

A PARTY FOR THE GAS-WORKS.

pany to the greater interest of the industry as a whole, because he believed, as a team man, that the interest of the individual undertaking was in the long run best served by considering the interests of the industry as a whole. He was glad to have the opportunity of saying this, because he spoke with personal knowledge of what it was due to Mr. Milne Watson that the industry should know. In the "B.C.G.A." they were trying to foster the spirit of team work, not only through the Executive and General Committees, but through the Salesmen's Circles up and down the country. These Circles, he believed, were doing very valuable work for the gas industry by the inculcation of the team spirit in the younger members from the very start. He would appeal to all administrators in the industry to give their staffs the fullest possible facilities for attending Circle meetings and also for entering the course of education which had now been established by the Institution of Gas Engineers, and which was growing in value and importance every day. Unless Boards of Directors and Committees were prepared to give their staffs the necessary facilities for taking up the courses, obviously the fullest use could not be made of the scheme.

The Wembley Display.

Speaking of the development of the national organizations of the industry for national service, Mr. Goodenough said that at Wembley this year they had in the Gas Exhibit touched upon the Imperial service side of the industry; and he thought that this had struck a note which was new to a good many members of the public. They had, he believed, in their work at Wembley done very great service for the industry, both last year and this. There was a tendency, possibly, to imagine that this year they had not done so well as last, because the organizers of the Exhibition had been very unhappy in their publicity, and had struck the wrong note—the note of financial failure—from the very beginning of this year; but the Gas Exhibit had, in relation to its cost this year, produced better results than last year. This was perhaps surprising to them; but it was a fact—based, of course, on the direct results which they were able to trace. But, as all of them knew, the value of such an enterprise was much more a matter of indirect results; and in this regard, he hoped they would bear in mind that last winter, following Wembley, witnessed for all of them an absolutely record season in the matter of gas apparatus and gas output. Both the President and Mr. Milne Watson had referred to the necessity for publicity; and, indeed, if one did not tell people what one could do for them, how were they to know? The world was full of a variety of things—to-day more than ever—and it was a great mistake to think that, because they knew all about the gas industry themselves, everybody else would take the same interest in it and know all about it, unless they took steps to tell them. Advertising was not necessarily blatant and vulgar, though every self-respecting man would prefer that others should judge his conduct and achievements, rather than that he should talk about them; and unless they presented to the world, effectively and constantly, the facts about themselves as an industry, it was impossible for the world to judge of their performance. It was not that they were desirous of boasting; but they wanted the world to know the facts, and then they would be content for the public to judge for themselves. In these days of large organizations it was difficult either for an employer to be known to his employees or for a trader to be known to his customers unless proper publicity was adopted. Publicity was an essential part of the machinery of civilization to-day. Truth was the enemy of ignorance; and publicity should be in their opinion—and he hoped always would be in their practice—only a statement of the truth.

The Special Campaign.

Mr. Goodenough, continuing, said he would like to refer for one moment to the special campaign that the Association were running at the present time—an educative campaign that was absolutely imperative. They were trying to do in respect to their constituents what the National Gas Council had so effectively done in regard to Members of Parliament. He would like to mention the result of the appeal that had been made.

AN INTERESTING MOMENT DURING THE TOUR.

The group includes, on the right, Mr. J. F. Ronca, Mr. Percy S. Hoyte, Mr. T. Hardie, and Mr. C. F. Botley.)

Already £15,000 had been subscribed, and money was coming in every day; but they wanted £25,000. If they could get it, they could spend every penny to full advantage. The Essay Competition had met with a wonderful response. They had already had applications for particulars from over 20,000 members of the public representing all classes of the community—particularly teachers, journalists, &c., whose opinion it would be very valuable for them to influence, by getting into their hands the real facts about the gas industry. In connection with the fund to which he had referred, there was one other matter he would like to mention. They had, of course, all noticed in the Technical Press that the first prize in the recent Coke Competition had been awarded to the Research Staff of the Woodall-Duckham Companies, by judges who knew nothing about the source of the essays when they were judged. The Research Staff of the Woodall-Duckham Companies had, however, decided that they would rather not take the prize, and that the money should be given to some deserving object. Well, the "B.C.G.A." was the deserving object to which it had been given; and he had received a letter from Sir Arthur Duckham enclosing a cheque for £200 towards the campaign. [Applause.]

Publicity Pays.

Publicity for the gas industry must continue, and in his (Mr. Goodenough's) humble opinion must increase, if they were to make the progress that undoubtedly they could and would make. To use a phrase of their President, "publicity paid," and it paid in more ways than one—in increase of business, in increase of output, and also in the readiness of the consumer to pay full prices for apparatus and for installation work. He did not know whether the industry had quite realized the financial advantage it had gained from the publicity work, which had been influencing public opinion so that it was receptive to canvassing and salesmanship generally. They knew in London that, instead of having to supply apparatus at low rentals and fix at reduced prices, in order to induce people to use gas, they could now charge economic rents, sell at an economic profit, and carry out installation work on economic terms; and if those effects of publicity were properly assessed, its value to the industry would be found to be much more than the money spent upon it.

Honorary Members of the Executive.

Before sitting down, said Mr. Goodenough, he had a proposition to make which was not on the agenda, and of which no notice had been given. He knew, however, it would be agreed to without question. Hitherto, when the President retired from the chair, he had ceased to have any direct connection with the Executive of the Association; but that morning the Executive had decided to ask the outgoing President of the Association to remain an honorary member of the Executive—because without an alteration of the rules they could not make him a voting member—for two years after he had ceased to occupy the chair. This would mean that in the next year they would have the advantage of the services of Mr. Wade Deacon as well as of Mr. Ellis; and in the following year Mr. Ellis would continue, and his successor in the chair would also become an honorary member. He was sure they would all feel that this was a very desirable course to adopt, and that it did not require any discussion. (By show of hands, the proposal was unanimously adopted.) He then moved that the report and accounts, as printed and circulated, be adopted.

Extracts from the Fourteenth Annual Report of the General Committee.

The accounts are for the year ended March 31 last; but the report deals with the activities of the Association to Sept. 30.

Income and Expenditure.

The income received in respect of subscriptions during the year shows an increase of a little over £4200. This satisfactory increase is due mainly to new members; to increased subscriptions from undertakings formerly subscribing on a partial basis; and to payment on increased output by the general body of regular subscribers. It is of interest to observe that the present basis of subscription—namely, 3s. 4d. per million c.ft.—represents an expenditure equal to *one-tenth of one p.ct.* on the annual revenue from the sale of gas, taken at an average price of 3s. 4d. per 1000, or £167 per million c.ft. In other great industries, expenditure on advertising ranges from 2 to 10 p.ct. upon turnover—because expenditure on that scale is found to pay.

The number of undertakings subscribing to the work of the Association is now 787, representing 92 p.ct. of the industry, calculated by output.

Publicity.

There has been a further substantial increase in the sale of publicity material to members for use locally; and for the first time in the history of the Association the sales have exceeded £10,000.

National and district publicity have been concentrated upon a number of leading newspapers selected by the Committee, district by district; the principal periodicals of general circulation; and the journals which appeal specially to trades and professions most closely interested in or important to the development of gas in the service of the community

The list could be extended considerably, the number and size of the advertisements inserted could be much increased, and the amount of editorial matter supplied be extended, with advantage to every gas undertaking in the country, if funds permitted. The work of the Association in its national and district publicity is largely to break down prejudices and create a public opinion more favourable to gas than before, and, therefore, more responsive to local effort.

The special campaign planned for the coming autumn has been directed to the achievement of a different object—one political rather than immediately commercial—namely that of bringing home to the public the magnitude of the industry; the importance of its present and potential services to the community; the facts as to the relative spheres of gas and electricity, especially in regard to fuel economy; and the injustice and folly of the State developing one industry artificially on uneconomic lines to the detriment of another.

Local Publicity.

The "copy" prepared for the national and district campaign has been put at the disposal of all—and has been used by many—subscribing undertakings so that their local publicity, in addition to making direct personal appeal to their consumers, may supplement the industry's co-operative efforts and definitely link them together in the public mind. It is hoped that this may be done very extensively during this special Autumn Educative Campaign.

Both in 1924 and in 1925 the Exhibition at Wembley has provided much good publicity for the industry, both directly and indirectly. The money spent on the British Empire Gas Exhibit since Wembley opened its gates has been returned to the industry already in abundant measure, and will continue to earn substantial profits for it for many years to come.

Advertising Conventions.

The Association was well represented at the first International Advertising Convention ever held in this country—namely, last year at Wembley—and also at the first British Advertising Convention held this year at Harrogate.

Local Exhibitions.

The services of the Association have been utilized several times during the past eighteen months in connection with the planning and organizing of local gas exhibitions promoted by members, and at other local exhibitions in which a gas exhibit has formed an important feature.

Film Publicity.

A Special Committee was appointed to inquire into the whole subject of film publicity for the industry; and following their report a cartoon film dealing with the all-gas house was prepared and is available for the use of members. The film has been exhibited at cinemas on behalf of many undertakings, and this form of publicity is recommended to the notice of members when making plans for local publicity campaigns.

Salesmen's Conferences.

The third year of salesmen's conferences finds this branch of the Association's activities doing increasingly valuable service for the industry as a whole and for the younger generation of its officers in particular.

In accordance with the resolution adopted at the Birmingham Conference in 1923, an Industrial Salesmen's Circle has been formed of those men engaged in this special and growingly important branch of the industry. With the co-operation of the undertakings most concerned, it is hoped to arrange for quarterly meetings of this Circle in the various industrial centres of the country, and also for an exchange of detailed information by correspondence.

Educational Propaganda.

The Children's "Fairy Gas" Competition of 1925—its tenth year—was made specially attractive, and the whole scheme has been raised to a higher level of educational importance and usefulness, by the adoption of the plan of awarding scholarships as first prizes, one of £50 for England, Wales, and Ireland, and another of similar value for Scotland.

Service to Members.

The Association are constantly seeking to develop and improve their individual service to members; and special attention has been given during the past year to the preparation of displays for showroom windows and interiors and for local exhibitions. Some thirty displays have been produced with the kind help and co-operation of several members; and these are in considerable demand in all districts.

District Conferences.

Successful District Conferences were organized and held at Leicester, Greenock, Minehead, and Harrogate. A special meeting was also arranged at Belfast in co-operation with the Irish Association of Gas Managers.

Election of Vice-Presidents.

The following have been added to the list of Vice-Presidents during the year:

The Rt. Hon. the Lord Mayor of Manchester (Alderman F. J. West, J.P., C.B.E.).
Councillor George Catto, Jun. (Aberdeen).
Sir John Meadows Frost (Chester).
Mr. Frank H. Jones (London).
Alderman J. E. Keighley, J.P. (Colne).
Councillor F. Pollard (Oldham).
Councillor J. D. Siddeley, C.B.E. (Coventry).
Mr. W. E. Whyte (County of Lanark).

Obituary.

The Association suffered loss during the period by the death of two of their Vice-Presidents, Mr. H. E. Jones (London) and Mr. John Murphy (Dublin).

Next President.

The Committee have the pleasure to report that Mr. John Edward Cowen, J.P., Chairman of the Newcastle-upon-Tyne and Gateshead Gas Company, has consented to be nominated for election as President for 1925-26.

Spend More on Advertising.

Sir Percy Stothert, K.B.E. (Chairman of the Bath Gas Company), who seconded the resolution, said the only criticism

he could offer was that they still did not spend enough on their advertising and their propaganda work—especially when they took into consideration the fact that their chief competitor, the electrical industry, spent many times more per annum in advertising and propaganda than the gas industry did. He believed it was only some twelve years ago that the Association came into being; and when it was first started, it began in a fairly humble way. It had since grown until 93 p.ct. of the whole industry were contributing members. He could not quite understand the mentality of those responsible for the administration of the 7 p.ct. of the industry that had not come into the fold, because he thought, without a doubt, it must now be recognized that the "B.C.G.A." to a large extent had been responsible for the considerable increases that they in the gas industry had been able to show in the development of their business during the past few years. In fact, the time had arrived when they must look upon the Association, not as an independent organization, but as an integral part of their business as distributors of gas in this country.

THAT 7 P.CT.

Alderman PHILLIPS (Salford) expressed his pleasure at having been able to attend once more the annual conference of the Association. He was at the first, and thought he had been at every one of the succeeding meetings; and he was delighted that the attendances showed continually increasing appreciation of the work of the Association. There was one matter to which he would like to refer, and that was to the pushing of electricity, to the obsession of the newspapers in favour of electricity, and to the opinion that gas was going and electricity was coming. There had just been an electrical exhibition in his town; and whether or not it was the result of it he did not know, but there had been an immediate increase in the demand for gas appliances. Members of his Council got up occasionally to inform the public and themselves that gas was almost dead, and electricity was the thing; and in certain of the Committees—and probably his own Corporation was not the only one—there was a tendency to waste public money, when an opportunity arose here and there of displacing gas and putting in electricity, with no advantage to anybody except those who fixed the appliances, and a trifling extra consumption of current. They were not afraid of electricity. In fact, he was more than ever convinced to-day that gas was not going, it was coming all the time. The past twenty-five years had witnessed a great development in the uses of gas—a development that was going on to-day, and would go on to-morrow, next year, and the years after. He was a firm supporter of gas, and had been all along; and he did not think they need fear the competition of electricity. There was something elusive about it; it rather intrigued people in a way, and they were inclined to attribute supernatural qualities to it. But when they had got it, they did not like it. If they had electric cookers put in, they wanted to send them back pretty soon; and then there was an increased demand for gas cookers. He was pleased to support the adoption of the report and accounts, and agreed that they should capture the remaining 7 p.ct. of the industry. He failed to understand how any undertaking, large or small—and he supposed they were small—could be content to remain outside the Association. The national organizations worked in perfect harmony; and he thought they were more indebted than they could acknowledge to gentlemen like Mr. Milne Watson for the splendid services rendered. The same remark applied to Mr. Goodenough, for his guiding hand in the policy of the Association and its work since its inception. The Association had done great work, and would do still greater work as time went on.

Mr. R. M. ROWE (Ilfracombe) asked why there was no item carried out against law charges for the year under review.

The PRESIDENT replied that they always endeavoured to avoid incurring legal expenses; and they were so absolutely reasonable and right that nobody dared to attack them.

The report and accounts were then unanimously adopted.

THE NEW PRESIDENT.

Mr. GOODENOUGH said he had pleasure in announcing that the Scrutineers reported the unanimous election of Mr. John Edward Cowen, J.P., the Chairman of the Newcastle-on-Tyne and Gateshead Gas Company, as President for the ensuing year. [Applause.]

[Mr. John E. Cowen is well known in the industrial world as a colliery owner, and as the head of the foundry works of Messrs. Smith Patterson & Co. at Newcastle. He is also a Director of the steel works and collieries of Messrs. Walter Scott, Ltd., of the Redhough Bridge Company, and of the High Gosforth Park Company. In 1909 he became a Director of the Newcastle and Gateshead Gas Company, and in 1918 he was appointed Chairman. Mr. Cowen has been a Justice of the Peace since 1901, and is nominated for the office of High Sheriff for the County of Northumberland. He takes an active interest in Church affairs, and is Chairman of the Executive Committee of the Newcastle Diocesan Finance Board. He is the grandson of the late Sir Joseph Cowen, who was M.P. for Newcastle for many years, and first Chairman of the River Tyne Commissioners, to whose wise direction Tyneside owes so much. His father, Colonel Cowen, was a pioneer of the Volunteer Movement, and at the time of his death was the oldest Commanding Officer in the country. The new President, apart from his business interests, has identified himself with the public life of his county, and is a keen sportsman, especially noted in the hunting field.]

Mr. J. E. COWEN thanked the members for the unanimous vote by which they had made him President for the ensuing year, and said he felt very unfitted to follow the great men who had occupied that office in the past. He was not a public man or a great engineer or gas administrator; and in the ordinary course one would think he was not the sort of person to accept the position to which he had just been elected. That being so, he might rightly be asked why he had allowed his name to go forward. His answer was simply this: "I believe in the 'B.C.G.A.;' and I believe that it is in the best interests of the gas industry that it should be supported, and made as strong and as representative as it possibly can be." The Company of which he had the honour to be Chairman had been supporters of the Association from the very first; and the policy of the Association had been, and ought to be in his opinion, to keep in touch with all those interested in the gas industry—not to concentrate its efforts on one centre or another or try to work altogether from London, but to go round the country for their meetings, as they had been doing. They had been to various places, and he thought other parts of the country should be visited which had not yet had the pleasure of welcoming the Association. There had not been a meeting in that great area of industrialism, of collieries, of iron and steel works, of shipbuilding, and other activities, and the centre of many of what were called the heavy trades of the country—the North-East Coast. Therefore he felt when he was approached on the subject that it was his duty to accept, as Chairman of the largest gas company in that area, one of the oldest, and one which covered, he believed, until the recent Gas Light and Coke Company amalgamation, the biggest area of any gas company in the country. He felt it would be to the benefit of the Association to go to the North-East Coast, and get in direct touch with the conditions and the people there; and so he had much pleasure, on behalf of himself and his co-Directors, in inviting the members to hold their conference in Newcastle next year. [Applause.] So far as the work of the Association was concerned, he felt he would be but a poor follower of the great gas administrators who had already filled the office; but he was confident that, with the help of the officials, the Association would go on and prosper. So far as he could, he would do everything to assist in this.

The PRESIDENT remarked that they were lucky to get so fine a business man and so excellent a sportsman, their friend Mr. Cowen, as their next President; and they would all look forward to visiting Newcastle. They would have there a treat such as was not possible in an unfortunately coalless place like Plymouth.

FIRST PAPER OF THE CONFERENCE.

Mr. PERCY S. HOYTE then read the first paper, entitled "Housekeeping without Tears." It will be found on p. 231.

THE EXECUTIVE AND STAFF.

Sir H. RUSSELL BENCRAFT, M.R.C.S.E., J.P. (Chairman of the Southampton Gas Company), proposing a vote of thanks to the Executive and staff, said he had been specially told that he was not to mention any names; but he was going to mention Mr. Goodenough. No Association had a more able administrator. There was a Scotsman who also contributed to the success of the organization. There was, again, a lady who added to their success, as well as a Secretary who did the same. In fact, he knew of no more enthusiastic staff than they had.

Mr. A. PROCTER (Chairman of the York Gas Company) was very glad of the opportunity of seconding the vote of thanks. They in York had been members of the Association ever since its inception, and they had come to know and appreciate the immense services rendered by it to the industry. He had had opportunities of coming into direct contact with Mr. Goodenough and the other officers, and had the greatest pleasure in associating himself with all that the mover had said with regard to the excellence of their services, and the great ability they brought to bear on the discharge of their duties. This vote of thanks was very well deserved.

The PRESIDENT: Mr. Goodenough has backed me up splendidly, and kept me well in the right path.

Mr. GOODENOUGH acknowledged the heartily accorded vote, on behalf of the Executive Committee, and all those who worked so excellently and so loyally for the Committee, and so made his own work possible and enjoyable. They had in all those associated with the work most enthusiastic, most keen, and most able officers; and he thanked the members for the warm appreciation they had shown of their efforts.

GAS-WORKS VISITED.

This concluded the morning's session, and in the afternoon motors conveyed large parties to the gas-works, where they were received by Mr. Hoyte and his assistants, and shown over the extremely interesting plant.

The works were described by Mr. Hoyte in his Presidential Address to the Southern Association of Gas Engineers and Managers (see "JOURNAL" for March 18, 1923, p. 824); and

additional information was given in the report of the Association's visit to the works which was published in the "Journal" for June 13, 1923, p. 663. Since that time, however, new work—demanded by a growing business and a progressive engineer—has been carried out.

Vertical Retort House.

The horizontal retort house is now out of commission; the whole of the coal gas being manufactured in the new Glover-West vertical retort installation. This comprises nine settings of eight retorts each, erected by West's Gas Improvement Company on a site originally occupied by an inclined retort installation, and has only been at work for the past six weeks. It is capable of an output of about 4 million c.ft. per day, and is equipped with two Bonecourt waste-heat boilers, each evaporating 7000 lbs. of steam per hour from and at 212° Fahr. A large proportion of this is used to supplement the supply given by a waste-heat boiler situated in the C.W.G. plant. At a later date it is proposed to extend this steam system to the residual boilers and the works power house, to ensure the profitable utilization of the whole of the surplus steam.

When steamers are discharging, coal is delivered direct in the vertical house, but at other times supplies are drawn by steam wagon from No. 1 retort house coal store, and tipped into the hopper at the S.W. corner of the new house; each load passing over an adjacent weighbridge. A short elevator delivers the coal into a breaker situated at ground level, whence it is elevated to the main lip bucket conveyor, which handles coal and coke simultaneously. Provision has been made for the duplication of this conveyor; and this will be installed early in the coming year.

The producers are fed through an Avery automatic weighing machine, and clinker is removed into telpher skips which are wheeled out of the south end of the house, and taken charge of by the existing telpherage system. A particularly interesting feature of the plant is an automatic skip-filler, which accomplishes the automatic filling of the telpher skips with coke upon the arrival of the lowered skip at the foot of the hopper provided.

New Tar and Liquor Tanks.

This site was originally occupied by a small holder which has been demolished; and by the provision of suitable partition walls the tank is being adapted for the storage of tar and liquor. Five separate compartments are provided, and the scheme includes a pump house in which will be centralized the tar and liquor pumps. The whole work, with the exception of the pump house, is being carried out in reinforced concrete, by the F.C. Construction Company.

Carburetted Water Gas Plant.

This plant comprises three 1¼ million c.ft. per day sets, and one 2 million per day set. The latter originally was identical with the three smaller sets, but has been recently remodelled by Messrs. Humphreys & Glasgow, to yield the increased output. It is equipped with a vertical waste-heat boiler and an automatic operator, which is at the rear of the stage. Hydraulic power is used for the various controls, and in addition to the automatically operated pilot valves the machine is equipped with a system of mechanical interlocks which ensure the operation of the controls in their correct sequence.

DINNER TO THE CONFERENCE.

In the evening a dinner was given in the Royal Hotel, by the Chairman (Mr. J. H. Ellis) and Directors of the Plymouth and Stonehouse Gas Light and Coke Company, to the President-Elect, Vice-Presidents, and members of the British Commercial Gas Association and visitors. Here one and all of the 250 or so who sat down spent an evening of perfect enjoyment. To the generous hospitality of the hosts were added some effective speeches—that by the Right Hon. Viscountess Astor, who is one of the Members of Parliament for Plymouth, being specially applauded. Good music was provided by the Royal Hotel Trio, and Mr. A. J. Coles ("Jan Stewer") contributed excellent entertainment of a humorous character. The Chairman was the President of the Association, Mr. Ellis; and the seats with him at the top table were allotted, among others, to Viscountess Astor, Alderman R. W. Winnicott, J.P. (Mayor of Plymouth), Mr. F. W. Goodenough, Mrs. M. A. Cloudesley Brereton, Mr. J. E. Cowen, Mr. H. Wade Deacon, Mr. C. F. Botley, Prof. J. W. Cobb, Sir George E. Davies, Dr. Margaret Fishenden, Mr. J. F. Ronca, Sir Percy K. Stothert, Mr. T. Hardie, Sir H. Russell Bencraft, Mr. T. G. Greek Wills, J.P., and Mr. B. B. Waller.

The Loyal Toasts having been enthusiastically drunk, at the call of the Chairman,

Made Brighter by Gas.

The Rt. Hon. Viscountess Astor, M.P., submitted "The Gas Industry," in a speech full of wit and vigour, which was heartily applauded by her hearers. She said:

Before I begin to speak, I should like to call someone to order—the Mayor of Plymouth. When I read his speech yesterday about the beautiful Plymouth sunshine, I just said to myself: He is asking for it. He knows these little occurrences always last for two days in Plymouth. If he had said: "You stop over the week-end, and we can guarantee the weather," it would have been all right; but he has been tempting Providence, and I am sorry he should have done so foolish a thing, particularly with a lot of gas men like you. However, if you just stop a little longer, you will see Plymouth is the last place in England where you ought to speak about darkness, because it is light in more ways than one, and a great deal of light that spreads in England comes from Plymouth. Now the last time I spoke about light I spoke about electricity. I could have spoken far more had I known then what I know now, which is that it takes 29 units of electricity to give the same heat as 1 therm of gas. [Laughter.] Think what an astounding speech I could have made. I would have sent them home with something to think about. But, as a matter of fact, I do not think that words mean much, unless there is knowledge behind them, and I do not really know what a unit or a therm is. I am not much good at talking about what I do not know. Of course, now I have finished with electricity for ever! There are over 30,000 women in Plymouth alone whose lives are being made much easier by gas, and there are millions throughout the country in the same position. I am not saying their lives are perfect; but it is up to you to make them so. To-day I went to see some people in the rooms in which they were living—a woman and her six children, and her daughter, son-in-law, and their child, in two rooms. Well, now, that is a horrible state to be in; but it was made brighter by one thing—they were cooking a very good dinner on a gas stove. Gas is to women the greatest boon possible. I use it in my own home; but I am not now talking of the well-to-do, but of people who live in small houses and a few rooms; and when I saw the appalling condition of that family, the one bright spot was the gas cooker. I know you men are a little frightened by modern women, with their bobbed hair and bobbed skirts—and I will not speak of freedom. Bobbed hair and bobbed skirts are very well, if they are not too bobbed; you can carry both things too far. But I do not think you need be frightened of the modern woman. After all, you men are always judging women by their outward appearances, and do not look deeper. That is where so many of you get let in. I have great faith in the modern woman. I think she is just as fine as the old-fashioned woman; and simply because she refuses to be a drudge, this does not mean that she is a worse wife. A proper kind of man would never want his wife to be a drudge. The women are fighting now for what men have had hitherto—equality, liberty, and fraternity. I am sure you do not grudge them that.

Women and Smoke Abatement.

Now you are going to find them your greatest help in your fight for smoke abatement. You have nearly broken your hearts in trying to make men change; and women are changeable creatures. In that lies the great hope of the "B.C.G.A." We do not change for the sake of changing, but when we see that it is right to do so. Go to the Black Country—to me it is one of the most heart-breaking things to visit there. When you think that with scientific development all that can be changed! They say they like smoke because it means work, but work at what a price—the price of sunshine; it is dreadful. When you tell them you have got something that will purify the air and brighten their lives, half your battle is won. I have seen that what women think of to-day, Governments do to-morrow. It is amazing how alert Governments are to what women want; and they are perfectly right, because the demands of women are all for better homes and for moral reforms. It is never anything that does not benefit men and benefit their children. And women understand better than men do what dirt is. Men do not understand it. Whether you live in a two-roomed house or a beautiful palace, a man coming in with dirty boots is the same problem. [Laughter.] You are all alike. So far as women are concerned, they have to put up with the carelessness of men. But I am not here to abuse men. I am here to praise them, and encourage them, and thank them, for the good work they have done in bringing gas into the homes. I hope they will go on. I want to congratulate you on what you have done, and beg you to press on. From many standpoints your industry is a blessing. For one thing, you cannot profiteer. Think of that! It is a remarkable thing that here we have got a business which cannot profiteer. And it is a great tribute to you for having it so. Certainly, at Plymouth our Gas Company are working on the only lines on which modern industry can flourish. We have co-operation and co-partnership. I do not care for people who say they want to go back to the "good old days." You are never going to do it. Just as the women are awake, so are the workers; and you are not going to get men to work in companies who do not give profits the same as in companies who do give profits. We have come to the stage where we want people, if they have talents, to develop them for the good of humanity, and not only for the good of themselves. It is a marvellous age in which to live; and I am not the least afraid of those who want to go too fast or those who do not want to go at all. We have both of these classes to contend with—some who do not want to change, and some who want to change it all. I like to believe people want steady progress. England's greatness has been made by people who wanted change; it has never been made by the people who did not want change. I know what it means, because I have been an ardent social reformer, always a little ahead of my time, owing to my representing Plymouth. But truly the problem in these days is steady development, going straight on, giving the workers an interest, letting them know you have something good for them, and good for the community. That is what you realize; and people who do not realize it are fast asleep. I believe that within the next fifty years the time is coming when there is going to be a great change in the outlook of the people.

What Woman Wants.

If you asked any woman, she would say: "I want to educate my boy, and get him a job, and then let him stand on his own legs." When we reach that point, we shall be rid of a great deal of greed in the world. And I think we are getting towards it gradually. For a Christian nation, it is the only proper outlook. I do say that Eng-

land wants to be a Christian nation more than any other country in the world. You are striving, and down in your hearts you really want to be; and now that women are coming forward, we shall make it easier for you. If you stand for what is right, they will give you their vote quietly. But you are ahead of your time. You have an industry which cannot profiteer, but which wants to make the lives of the women and children, and therefore of the men, happy. And, after all, happiness lies at home. I am sorry for the man or woman who has not a happy home. It is a terrible thing. It is the simple things of life that we all want; but the simple things are very difficult to obtain. We do not get them except by a struggle. We shall not have gas in every home without a struggle. The women will help you, but the men are slow to change. However, you are on the road to prosperity. We in Plymouth are "doing our bit." The Gas Company could not possibly have chosen a better man than Mr. Ellis; and you ought to be grateful for having him as your President, as we are in Plymouth for all he has done. We are changing, and we are going to change; and mercifully women and members of the "B.C.G.A." are progressive. I ask you to drink to "The Gas Industry," and I hope that your association will come to Plymouth again.

The Opportunity for Service.

Mr. J. E. Cowen: After the very brilliant and far-seeing speech just delivered by Lady Astor, anything I may have to say must appear in the nature of an anti-climax. However, I must, I suppose, fulfil the duty of replying so far as I can to the toast she has proposed. In the first place, I should like to thank Lady Astor most sincerely on behalf of the gas industry for what she has said with regard to their efforts for social reform in the lead they have given to industry as a whole in the matter of profit-sharing and the sliding-scale to regulate dividends according to prices. It is true that there is no other industry that has changed its methods on anything like the same scale as the gas industry. What it has done must be not only for the benefit of the industry, but for the benefit also of the public it serves. Now, as you all know, the history of the gas industry is an interesting and romantic one; and when one looks at the progress of the industry in little over a hundred years, one is astounded at the universality of gas, and the way in which it affects the lives of the people in every possible direction. You have gas in the factory, in the office, and in the home, in every possible use. It touches not only one class, but every class; but, as Lady Astor says, it does do more, and can do more, in the working-class community than any other. It is in such a direction as this that the opportunity for service which the gas industry offers must particularly appeal. The service it can render to the country in the most efficient way of using its coal resources is most important. In another direction, those of us who heard Dr. Saleeby last night must have been impressed with the enormous possibilities for good that there are in gas in smoke abatement and the improvement of the health of the people. Again, to the individual householder, as Lady Astor has well pointed out, there is the saving in drudgery and the improvement in the lot of women, particularly those who have the whole of their household work to do.

Why Low-Temperature Carbonization is Not Yet Adopted.

I would not presume, in a gathering such as this, to speak in any detail on the technical side of the industry. I would only say that, so far as the manufacturing side is concerned, we may congratulate ourselves that we have been on the whole progressive. The chief business on that side of the industry seems to me to be the supply of clean, good gas of a suitable quality at an even pressure, and at a cheap price. ["Hear, hear."] It makes also at the same time the best use of the raw coal with which it is dealing. Much as the gas industry has already done, it will do even more in the future. I think the technical side is meeting its obligations. To do that, we must ever be in touch with research work and the results of experiment; and in this connection, there unfortunately has been lately an idea that the gas industry has not been taking proper advantage of low-temperature carbonization, and that, in fact, low-temperature carbonization, *plus* electrical development, is going to be the salvation of the country. So far as the gas industry is concerned, many systems of low-temperature carbonization have been tried, and are being tried. The gas industry has always been willing, and is willing to-day, to try whatever systems are practicable; and the reason that low-temperature carbonization has not yet been adopted is simply because it is not so far a commercial proposition. ["Hear, hear."] When either the gas industry or other people demonstrate that low-temperature carbonization is a commercial proposition, then the gas industry, I have no doubt, will receive it with open arms, and adopt it in any form that is most beneficial to the community.

Selling and Utilizing Gas.

I now turn to the side of the apparatus manufacturers—the apparatus through which gas can be applied to the best advantage in its use. We are thankful that such great strides have been made in past years in the improvement of such apparatus. While we do not attempt to claim that anything like 100 p.ct. efficiency has been attained—as is claimed by the electrical industry—great advances have certainly been registered. But there is still room for further progress, and a group of principal firms have shown that they are alive to this fact by the opening recently of new research laboratories, for dealing with the whole of the problems connected with the apparatus. ["Hear, hear."] Next we come to the salesman, who has the duty to perform of persuading particularly the women to use gas. In respect of salesmanship, I think there is no doubt that the "B.C.G.A." has done an enormous work of improvement throughout the industry. What the Association has done in the short number of years it has been in existence, is really astonishing. When one thinks of the magnificent results to be obtained by the use of gas, when one thinks of the tremendous benefit to the community that would accrue from the use of gas instead of raw coal as a heating medium throughout the country, it must be an inspiration to all of us connected with the industry, in whatever capacity, to come forward and make the gas which we produce available and used in every home throughout the country. I venture to say it is the ability of the gas industry to carry out that idea, which is the main thing that gives me hope in the future prosperity and advancement of the industry as a whole.

Parliament and the Electrical Industry.

There is one other subject to which I should like to refer. I do feel I ought to say one word with regard to the attitude that Parliament seems to be showing towards the electrical industry. I do think, so far as we can ascertain, that this attitude is rather one-sided, and rather unfair to gas. ["Hear, hear."] I have nothing to say—no gas man has anything to say—against the normal development of electricity. There is ample room for both industries to work for the benefit of mankind. What we do say is that such development as is contemplated, so far as we can learn from the propaganda in the Electrical Press, is development which is inspired in large measure by interested parties, and is development which will disappoint, not only the public, but the electrical industry itself, in the long run. It is well known to us in the industry that gas as a fuel cannot be touched for efficiency and economy. The facts are well known to the industry, but what is necessary now is that those facts should be made known to the public, because public opinion in the long run is the thing that will "rule the roost." The ideas of individuals may hold for a time; but unless they can persuade the people of the country to their way of thinking, they will not hold for long. Therefore we should let the country know what gas can do, and what electricity can and cannot do. In connection with that, may I say that the President of the National Gas Council, whom we were delighted to have with us this morning, and who is the leader of the gas industry in this matter, has shown in all subjects that the Council have dealt with great tact and ability? I venture to say he has the confidence of the industry; but, that being so, it is no use leaving the work entirely on one man, because one man cannot possibly carry it out. He must have the support of the whole industry behind him. I do ask that we, in our various positions in the industry, should help in every way to support him, so that he may be able to put forward the case for gas, and ultimately enable the gas industry to go on and prosper in the future, as I venture to think it is likely to do, with proper management. I am sure that the industry which we all are proud of is not by any means a dead industry, to be superseded by electricity, but is an industry which has a great future, for the benefit of mankind.

The Borough of Plymouth.

Sir George E. Davies (Chairman of the Bristol Gas Company): I take it as a great honour, and at the same time a great responsibility, to propose the toast of "The Borough of Plymouth." I have always recognized that the history of Plymouth was to a large extent interwoven with the history of England. If I were tempted to say very much about the history of Plymouth, I could only repeat what every inhabitant knows, and what the inhabitants of every other city in the country ought to know. In visiting this borough, whose hospitality we have enjoyed, we are visiting a place of great antiquity and great enterprise. It is because we recognize that Plymouth is still showing a spirit of enterprise that we very heartily desire to express our appreciation of what we have seen, and to wish Plymouth all prosperity in the future. Looking through a budget of memoranda kindly supplied to me by Mr. Ellis, who is one of the most courteous and painstaking men I know, I find that as far back as 1835 certain Commissioners came down and investigated the conditions of the municipal government of Plymouth; and this most extraordinary paragraph was included in the report: "We have not visited any Corporation in the West of England so well managed in all respects as the Corporation of Plymouth." We of the "B.C.G.A." very much appreciate the way in which we have been received in this ancient borough. ["Hear, hear."] In the first place, I would desire to express to the Mayor our very sincere thanks for the warm civic welcome he gave us at the reception last night. We should also like to thank him for coming and opening our business proceedings this morning. We desire, too, to express our thanks to Mr. Ellis and the other Directors of the Gas Company for the trouble they have taken to make the visit a useful and a pleasant one, and for the opportunity of seeing over their works.

The Mayor: I thank you for the cordial reception you have given to this toast. I am proud to be the civic representative of my native town. The history of Plymouth is a wonderful story indeed. The Port of Plymouth is known to have been the cradle of the British Navy—the Navy of which we are all so proud. Apart from our being a centre of naval and military activity, we are proud of the part Plymouth has taken in the Arts and Sciences. Coming to later days, we have our President, who holds the Freedom of the Borough, and by his foresight and excellent administration has added much to our development, for which we owe him gratitude. Again, as you all know, we sent to the House of Commons the first lady member. We in Plymouth are proud of her. She does her duty to our town as well as any member who sits in the House. I wish your Association continued success, and that you may lead the way in ridding our cities and towns of smoke. May you soon come to see us again, and pay us a longer visit.

The Visitors.

Mr. T. Greek Wills, J.P. (Deputy-Chairman of the Plymouth and Stonehouse Gas Company): I have great pleasure in proposing "The Visitors." I cordially thank you for your attendance, and hope you have had a pleasant evening. If you will refer to the last year's reports, you will find that Plymouth has the greatest record for sunshine in the West of England. We have some of the most beautiful spots in the County of Devon, and I should like you to see them. On behalf of the Directorate of the Company, I give you this toast.

Mr. JAMES F. RONCA (Director of Gas Administration to the Board of Trade): I feel I owe a kind of explanation to the visitors, because I am sure in the time of my association with this important industry I am easily the most junior visitor present; and I can see many around who could reply far more fittingly to the toast than I can do. The honour which is apparently done to me is really to the office I serve, and is very largely due to the work of my predecessor. As a member of the less prominent sex, naturally some things which strike me as being worthy of mention are those associated with bodily comforts; but apart from these, we have had extremely interesting papers and a visit to an extraordinarily well-run gas-works. For all that we have enjoyed, I offer, on behalf of the visitors, very sincere thanks.

M. MOUGIN (Secretary of the Société Technique de l'Industrie du Gaz en France): I will take the liberty of speaking a few words to convey to you the best greetings and most hearty compliments from the Société Technique de l'Industrie du Gaz en France. A member of our Committee, M. Baril, attended last June the meeting of the Institution of Gas Engineers; and in the absence of M. Rolland d'Estape, detained in Paris, we have come to your annual conference to learn with you how we can enlarge our point of view and help towards the progress of our industry in contributing to social welfare. This shows how anxious we are in France to keep in close connection with all the activities of your industry; and we may say that the "B.C.G.A.," by its constant effort, has not only helped the gas industry in your country, but the gas industry of the whole world. I must tell you how impressed we have been in coming to this old city of Plymouth, where all the names speak the history of England. And we are also thankful for the most interesting speeches that were delivered yesterday evening and this morning, and for the visit to the Plymouth Gas-Works, where we have been once more convinced that the British gas industry is always ahead in the march of progress. I drink to the Plymouth and Stonehouse Gas Company, to the British Commercial Gas Association, to the British gas industry, and to every one of you, ladies and gentlemen.

CONSERVATION.

At Wednesday morning's session, the following papers were presented by the authors, and summarized by them:

"Conservation of the Nation's Store of Solar Energy," by Prof. John W. Cobb, C.B.E., B.Sc. (Livesey Professor and Pro Vice-Chancellor of the University of Leeds).

"Conservation of the Nation's Resources of Human Energy," by Dr. R. Veitch Clark, M.A., M.B. (Medical Officer of Health to the City of Manchester).

"Conservation of the Nation's Vegetation," by Mr. Robert W. Ascroft, M.B.E., F.R.H.S.

The papers, and the subsequent remarks, will be published next week.

The PRESIDENT was, on the proposition of Mr. WADE DEACON, heartily thanked for presiding.

LUNCHEON GIVEN BY THE "B.C.G.A."

The business of the conference concluded, those present sat down in the Royal Hotel to luncheon, given by the President-Elect, Vice-President, and members of the British Commercial Gas Association to the President of the Association and the Directors of the Plymouth and Stonehouse Gas Light and Coke Company. Mr. J. E. COWEN was in the chair, and proposed the Loyal Toast, which was enthusiastically honoured.

APPLICATION OF ELECTRICITY TO INDUSTRY.

The CHAIRMAN: The toast which I now have the honour of proposing is that of "The President and the Directors of the Plymouth and Stonehouse Gas Light and Coke Company." In the ordinary course, I should content myself with expressing to them our thanks for their extreme kindness to us here in Plymouth; but before doing that I would like to refer to one other matter for a moment or two, because of a remark by the brilliant and charming lady who proposed the toast to which I had to reply last night. This has relation to the application of electricity to industry, in contradistinction to gas, and what it can do and what it cannot do. I will give you an instance from my own experience. The district in which I live is covered already by an Electricity Company which is probably the one upon which the ideas of the Government with regard to these super-stations, and so forth, and cheap electrical power are based. It is the greatest Electric Power Company raising power from steam in the world, I believe, and we have there a cheap supply of electricity. Now, the point I want to bring out is that probably one of the principal reasons why these propositions with regard to electricity are receiving so much attention, and public thought is being brought so much to bear upon them, is the fact that it is contended that they would do a great deal for unemployment, which would be much lessened by a cheap supply of electricity on a universal scale to the industries of the country. Our district is one in which the heaviest industries are well represented; and we have as much unemployment in our area as, if not more than, any other part of the country. A Company of which I have been a Director for thirty years, and Chairman and Managing-Director for the past fifteen years, is typical of many others; and I give you this first-hand information. It is a Company which does a foundry and engineering business on a considerable scale, having an output of many thousands of tons of castings per annum. In that business we have no steam raising by coal at all. We are totally electrically equipped for our power for cranes, machines, &c. Everything connected with the power, except locomotives and travelling cranes, is electric. Our light is all electric, but our heating and furnace work is all either coke or gas. Now, under these conditions, I take it we ought to be able to do very well, and to get a very great benefit from cheap electricity, if anyone can get it; and what do I find is the position? After you have provided for wages and material for manufacture, you then come to your own charges, which include all such things as power, and so forth; and when you look at the total cost of the manufactured article, you find that the cost of electric power which we are paying is probably less, but certainly not more, than three-quarters of one per cent. of the total cost. If they gave us the electric power for nothing—and I do not imagine even the Government schemes with the best ideas of subsidy will do this—we could only save that. Suppose we got 50 p.ct. reduction, it would mean three-eighths of one per cent. in our case. Inasmuch as to secure business at the present time one has to take orders at prices that will not give more than (say) 25 to 30 p.ct., and is lucky to get 50 p.ct., of the standing charges, I do not see what help we are likely to get from even the most favourable electric schemes that may be put forward. I think, therefore, I can bear out by facts any statements I may have made last night on behalf of the gas industry. We owe a great debt of gratitude to Mr. Ellis and his co-Directors for their extreme kindness to us during this meeting at Plymouth. I feel sure it has been a successful meeting from every point of view. We are certainly indebted personally to Mr. Ellis for much of the success which attended the dinner, and for the manner in which he has conducted the business throughout the conference. We are extremely grateful for the entertainment they have given us, and for the visit to the works.

LOYAL SUPPORT.

Mr. ELLIS: Allow me to thank you on behalf of the best set of colleagues that any man ever had, for the way in which you have received this toast. It is owing to their loyal support that I have never had one moment's difficulty, except with regard to a short strike which we readily overcame (with the goodwill of our men), since I have had the honour to be their Chairman. They have supported me throughout, or rather we have been as one man; and from the time I was asked to join them to the present day, we have never had one motion submitted to the Board of Directors that has not been unanimously carried. And why? Because they are men of sound judgment, and have the whole of the facts before them. That is the simple reason. And the country generally is composed of people of sound judgment; and if they have the full facts before them, we can rely upon the nation to decide what is right. That is why, the facts being on our side, and we being occupied in a good and great industry, we need have no fears whatever for the future. In those who serve our Company, our first consideration has been war work well done, and with regard to our Board the same thing applies. May I say one word with regard to the office I have just shed? This I have left in the competent hands of a great master of industry. I accepted it with fear and trembling. I declined it at first; but it was pressed upon me so kindly that I had to accept it. Then I found that I need not have been afraid at all, with our friend Mr. Goodenough and the splendid staff by whom he is surrounded. With their assistance, how can a man go wrong? I am delighted that you, Sir, have been called to the chair, following a long line of distinguished predecessors, and that we are to have the benefit of seeing you in your home at Newcastle next year. Thank you all for the kindness with which you have treated me.

THE ENGINEER AND STAFF.

Mr. F. W. GOODENOUGH: None of you would wish to go away without giving best thanks to, and drinking the health of, Mr. Hoyte, Mr. Bolton, and other members of the staff of the Plymouth Gas Company, who have done so much to make this meeting a success. [Applause.]

Mr. PERCY S. HOYTE: I thank you all for the way in which you have received this toast, and am glad you included in it Mr. Bolton and the staff, because a good deal of the work does fall on them. It would be impossible, also, for us to carry on unless we had the most cordial support and co-operation of the Chairman and other members of the Board. We have been almost overwhelmed by the way in which you have expressed your appreciation of what has been done for you.

INSTRUCTED PUBLIC OPINION NEEDED.

We have had a most inspiring meeting this morning. What are we going to do about it? We are carrying on a campaign during the present month which is costing a good deal of money; but are we going to switch off that after Oct. 31? I most sincerely hope not. People who are advocating alternative methods of treating our main asset are extraordinarily active. After half-a-century and more of free education and the hundreds of millions of pounds spent upon it, there are still men who invent, people who will print, and others who will read with avidity the sort of rubbish that is being published in the newspapers nowadays. I do hope the "B.C.G.A.," which is the leading body trying to guide the nation on economic lines in the matter of conservation of our coal resources, will persist in its campaign. Whatever it costs, we must spend the money, not merely for our own sakes, but for the sake of the nation, so that we may create instructed public opinion, in place of what I fear to-day is a very uninstructed public opinion.

THANKS.

Mr. H. WADE DEACON proposed the toast of "The Press."

Mr. F. ST. G. GRATWICKE, Editor of the "Devon and Exeter Gazette," responded.

Mr. T. GREEK WILLS, J.P. (Deputy-Chairman of the Gas Company): I move a vote of thanks to the Chairman, and all who have so kindly entertained us. [Applause.]

The CHAIRMAN: Thank you. I hope as many of you as possible will come to Newcastle next year. We will try to give you a hearty welcome; but I do not think we can hope to exceed, even if we can equal, the welcome that we have received here.

This ended a conference which left nothing to be desired in any respect except the one over which the hosts and those responsible for the arrangements had no control—the weather.

HOUSEKEEPING WITHOUT TEARS.

By P. S. Hoyte, A.M.I.Mech.E., Engineer and Manager, Plymouth and Stonehouse Gas Light and Coke Company.

[A Paper at the "B.C.G.A." Plymouth Conference.]

[The author's case for gas is couched in an easy style that should appeal to the ordinary consumer. He visualizes the smokeless era of the future, and gives striking figures to show the potentiality of the Plymouth therm at 6½d.]

Among the byways of our present existence that may tempt the curiosity of the philologist of the future, probably few will lead to more speculation than the origin, decline, and disappearance of some of our daily expressions and proverbs. "Pigs might fly" has represented, until quite recently, the acme of the impossible; but at no distant date the road hog will most assuredly have his aerial counterpart doing after his kind somewhere in the central blue. "No smoke without fire" will, in his serene and sunlit, because smokeless, age be understood only in a vague and esoteric sense; but the saying that will most perplex our future inquirer is one that will certainly have had its equivalent in every spoken language since the primal pair set up housekeeping—our English version of which runs as follows: "Woman's work is never done."

His eye will wander over his peaceful, because probably servantless, home amply provided with what will still be, as ever, the first necessities of civilization—artificial light and heat. He will see the happy and care-free face of his wife, care-free because at liberty to enjoy ample leisure; and, considering that all popular sayings must at some time or another have had some substratum of fact, he may resolve to discover how on earth, in the not so very distant past, this, to him, absurd expression arose.

Pursuing his investigations, he may be fortunate enough to discover in some remote vault of the British Museum the records of the transactions and activities of a defunct body that styled itself the British Commercial Gas Association, and will read with clearer understanding, not unmingled with amazement, of the war which this Society had to wage, not only against the criminal squandering of our nation's chief asset, but for the domestic, as distinguished from the political, emancipation of womankind. He will begin to realize how not only the freedom from work and worry enjoyed by his wife, but the cleanliness of his city's buildings, his house, and his garden were due in no small measure to the activities of this band of pioneers.

He, in his day, will, of course, be aware that the mere possession of raw coal by the private individual is prohibited under the severest penalities, and that every ounce of this most valuable of all minerals is consigned to the care of certain experts, known as gas engineers or gas chemists, who, by a highly scientific and economical process known as "carbonization," convert it into the invisible intangible fuel that not only provides his home, and those of his fellows, with light and warmth, but also an infinity of fine chemicals, fertilizers, and motor fuels, adding to—instead of, as in the bad old days, wasting—the nation's wealth. With an expression of contempt for an age that licensed every man to pollute the common air, our descendant's inquiries may terminate; but we can well ask ourselves whether that happy household, that city of sunlight and cleanliness, is not attainable in our own day.

Surely, of all the Utopias, New Jerusalems, Castles in Spain, and Homes for Heroes, in which the very children, if any, are to be incubated by electricity, this cleanly, smokeless city and its surrounding villages with their dirt-free and labour-saving houses, whose inhabitants can look up to a clear sky, and really believe in their hearts that "God's in His Heaven"—this is at least within our grasp.

We cannot, as Mr. H. G. Wells proposed in "The Days of the Comet," have our annual Beltanes or rubbish burnings (it took a *green* gas to do that); and although the Prime Minister recently suggested the "evisceration" of our cities (London is not now the only wen), most of us are condemned for many years to exist in one of these thousands of basemented and atticed nightmares which resemble lighthouses only in the number of their stairs.

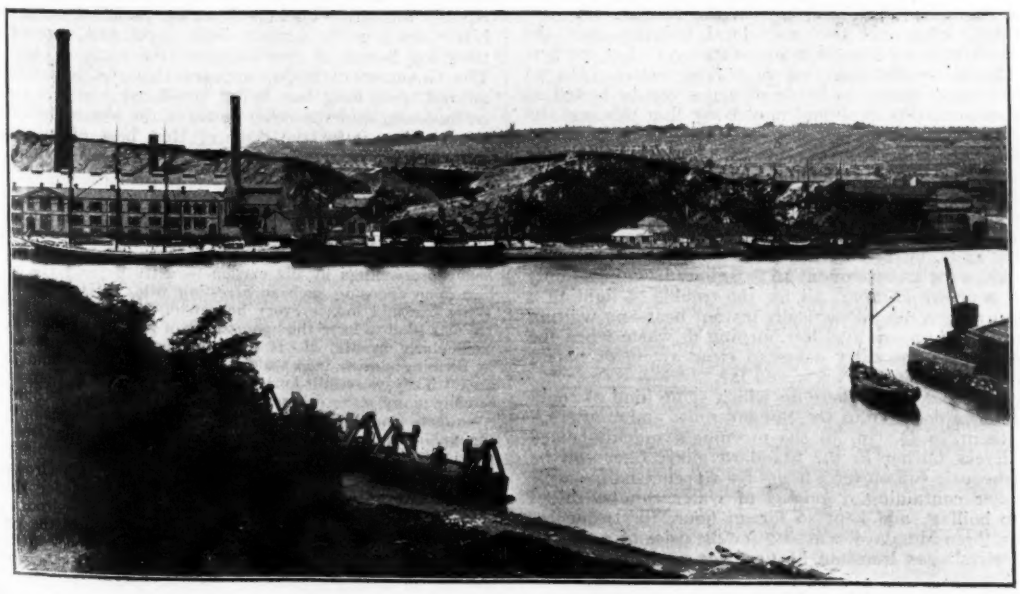
However rapidly the national pocket and the operatives of the building trades permit us to build, the new dwellings will for a long time yet form only a small percentage of the total. Still, talking about houses, just a word on homemaking, which must, of course, precede housekeeping. We have come a long way since, according to Mr. Kipling, "the woman lit a nice fire of wood at the back of the cave, and hung a dried wild horse's skin, tail down, across the opening of the cave, and said to the man, 'Wipe your feet, dear, when you come in, and now we'll keep house.'" We have come a long way, but not far enough; and as a further stage our so-called Ministry of Health—the smoke from whose innumerable raw-coal fired grates ascends, not far, unto Heaven before descending grimily upon the neighbouring populace—might set some example and give some encouragement to local authorities and others to carry their occasional provision of gaseous, labour-saving fuel to other rooms besides the scullery; for even to-day one may see thousands of houses in course of erection with open, solid fuel grates with expensive space-absorbing chimney breasts even in the bedrooms. Does anyone ever use an open coal grate in a bedroom?

Now what can gas do to help the housewives, not only in the new homes, but also in that far larger number of existing ones? What cannot gas do? From the cradle to the grave, from heating the water for the new arrival's first bath, to the gas-fired crematorium at Hendon Park, there is hardly an industrial, and certainly not a domestic operation in which gas cannot be of active assistance.

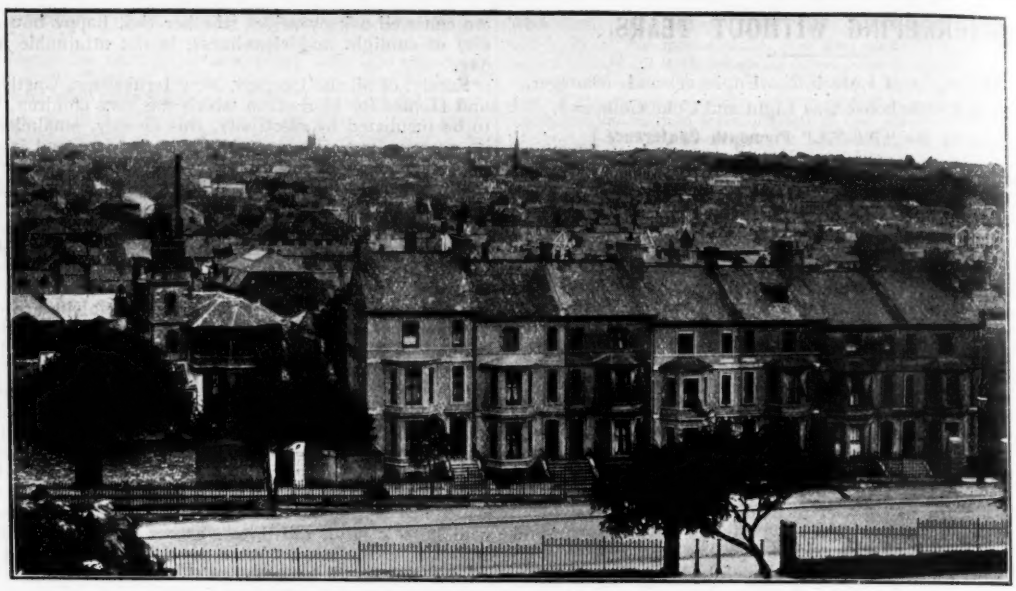
It is all very well for one of Sir Arthur Pinero's witty characters to remark:

> "If I had a little wife what wouldn't go,
> Do you think I would wallop her? No, no, no!
> I'd sack all my servants, and live in hotels,
> And spend my life gaily in ringing the bells."

For the majority of us, this won't do, for, after all, there's no place like home, and however much we men may talk, women are, as usual, solving the problem in their own fashion. It was stated only a few weeks ago that during the past four years alone the Birmingham Corporation Gas Department had fixed more than 32,000 gas fires and 40,000 gas cookers in its area—every one, I'll be bound, ordered by a woman, and making for ever impossible the dirty, smoky coal grate or stove. Every other city and town in the country can,



PLYMOUTH ON A COLD OCTOBER MORNING.
The absence of smoke should be noted.



ANOTHER VIEW ON A COLD OCTOBER MORNING.

according to its size, tell the same tale; and in Plymouth it is interesting to note that the majority of gas fires are now fixed in rooms occupied by the family during the day and evening. The accompanying photographs show, I think, how far we, here, have gone in the elimination of the coal range and coal fires. They were taken on a cold morning this month, when a very large number of houses must have been using some kind of artificial heat. No prize is offered for counting the smoky chimneys.

Now, will anyone ask, " what is to be the cost of the service gas can render? "—for in these days when the prophesying upon the swiftest horse, that sport of kings, is giving place as a national pastime to the spending of other people's money, that sport of politicians, does anyone worry about cost? I think so. It is the first thought of every good housewife, and most certainly of those engaged in supplying her with the cleanly, labour-saving means of keeping her house running. In some monetary terms there is great magic, from the £10,000,000 unit of our Government Departments to the humble offertory-box threepenny-bit; but until quite recently, and perhaps still, even the smallest town boasted its sixpence-halfpenny bazaar, for which modest sum an infinite variety of goods—mostly, I fear, of non-British origin—might be purchased.

Sixpence-halfpenny—the price of one therm, or 222 c.ft. of gas in Plymouth to-day! Not only all-British, but every cubic foot and British thermal unit of it made and distributed in our town of Plymouth. More than one-half of the capital of the Plymouth and Stonehouse Gas Light and Coke Company is held in Plymouth. More than one-half of the shareholders are Plymouthians, and the staff, stokers, inspectors, labourers, fitters, and mainlayers supplying the needs of nearly 40 thousand consumers spend their earnings in the district.

Now, briefly, what can this very local industry give the Plymouth housewife for her sixpenny-halfpenny? Let me first take that almost hourly operation of boiling water. On an ordinary gas ring a quart tin kettle of water can be boiled 90 times for sixpence-halfpenny—and may I say that this and the following figures are not estimates, but have been, and can be, verified by actual tests at our works. One large inverted burner will give 44 hours, a medium inverted burner 74 hours, and the small bijou burner no less than 111 hours of a light which does not try the eyes, for the same sum. A room 12 ft. by 12 ft. can be warmed with healthful radiant heat for eight hours, and a 14 ft. by 15 ft. room for six hours for sixpence-halfpenny, while for an apartment 16 ft. square it will cost only a trifle over a penny an hour, all for the trouble of lighting a match and turning a tap. Practically instant heat—no waiting for the fire to burn up—no fuel left burning to waste when the room is unoccupied—no dirty ashes to clear away, or paper, sticks, and coal to pick up, carry, and lay.

What day of the week is there on which some kind of cooking has not to be done, from the Sunday roast and " afters," as we call them in Devon, to the morning's quickly-heated porridge? Every burner in the Standard gas cooker can be kept simultaneously full on for 3 hours for sixpence-halfpenny.

A washboiler containing 9 gallons of water can be raised from cold to boiling, and kept so for an hour, for twopence, or more than three Mondays' washing for the price of a therm; while a " Fairy " gas iron can be used for 44 hours for the same sum.

A geyser will give 20 gallons of bath water at 120° Fahr.—hotter than most of us would care to get into—at less than 1d. per bath; in fact, no fewer than 165 gallons of water may be heated to this temperature for our magic sum of sixpence-halfpenny.

Tiresome iteration it may be; but is it nothing to you, ye distressed housewives, wearied with perpetual laying, stoking, cleaning and re-laying of your coal-fired kitchen ranges, your living room, bedroom, and wash-boiler grates?

Now, I am fully aware that every man with something to sell is regarded by the public as having a close kinship with the cobbler in " Julius Cæsar," who, when asked why he led the crowd about the streets, replied, " Marry, sir, to wear out their shoes, and get myself into more work," and that the gas industry is not entirely altruistic in its efforts to lighten the burden of housekeeping.

Our staff regards without tremors a notice-board outside a house advising all and sundry " electric lighting by such and such a firm," knowing full well that, owing to the almost entire absence of heat from this form of illumination, a substantial order for gas fires is certain to follow.

But when it comes to cooking and water heating, not all the combined eloquence of politicians and company promoters can alter the fundamental scientific truth that it takes 29 units of electricity to give the same heat as one therm of gas. My Chairman has already referred to low-temperature carbonization; but in so far as this is intended to produce a smokeless solid fuel, I may point out that every gas undertaking in the country is already doing this by high-temperature carbonization, and that as a cleanly smokeless solid fuel (where this is preferred to the really more convenient gaseous fuel) properly graded gas coke has no superior.

You all remember the very old story of Buridan's Ass who, unable to make up his mind between a bundle of hay and an equally attractive bucket of water, perished miserably. Later historians provide a sweet little maid who, advancing with a tempting bunch of carrots, gave the story a happier ending. The Government to-day appears to stand somewhat like this animal, one long ear being projected towards the electrical enthusiasts, and the other towards the low-temperature visionaries. May it be the duty of that best of all good fairies, that maid-of-all-work, gas, to show the excellent and more economical way.

Discussion.

Mr. A. W. SMITH (Birmingham) said he was sure he was expressing the wishes of the assembly in offering Mr. Hoyte hearty thanks for the admirable manner in which he had lightened their somewhat heavy proceedings by his extremely witty paper. He congratulated him upon choosing such an arresting title. " Housekeeping without Tears " would induce every housewife to read what he had to say. He was glad to have the opportunity of proposing this vote of thanks, particularly as Mr. Hoyte had mentioned the results of the efforts in Birmingham to increase the use of gas cookers and fires in their area. They were still extremely busy in this direction, and were receiving many more orders than their staff of fitters could cope with. Architects and builders were also becoming increasingly aware of the public demand for gas appliances, were making more adequate provision for them in new property, and to a rapidly increasing extent were themselves installing, particularly in bedrooms, a built-in gas fire of the type which Liverpool adopted for their housing schemes, in place of the old inartistic and useless bedroom coal grate. There had recently been evidence in Birmingham of the public appreciation of the amenities they had to offer, in connection with gas installations in court and terrace property. He was being constantly supplied by several members of the City Council with lists of tenants of such houses who desired a gas supply; and by concessions to landlords and in other ways they had put in a large number of automatic

meter installations in such property during the last twelve months, and had received enthusiastic letters of thanks from the tenants, who had discovered the increased convenience, cleanliness, comfort, and leisure which the use of gas appliances gave. The capacity to render such service carried with it the duty of letting the people know what they had to offer. The "B.C.G.A." helped them to do this by its advertisements and propaganda work; but it was necessary for them to adopt "live" methods themselves in their own districts. There was nothing like direct personal touch with one's consumers whenever and wherever possible. As an instance of what could be done, he might mention that recently they had adopted in Birmingham a system of house-to-house canvassing (with samples) for orders for gas coke properly prepared and graded for domestic use, and in the last three months had obtained over 1500 new coke customers in this way. In the last four weeks, out of 525 calls made, no less than 388 orders for coke had been obtained. What applied to coke sales, applied with equal force to sales of gas and gas appliances. There must be live methods in the sales organization of the gas undertaking, or the efforts of the "B.C.G.A." would be stultified. He congratulated Mr. Hoyte upon his success in Plymouth, and particularly on the low price at which he was able to sell his gas.

Mr. T. P. Ridley (Newcastle-upon-Tyne) said he had very great pleasure in seconding the vote of thanks, and in doing so would congratulate Mr. Hoyte on his paper. He had given them, in his usual breezy manner, a very excellent contribution. He had shown them what they had to aim at, and what the Association had to aim at—to do away with all smoke.

Mr. C. F. Botley desired the privilege of being associated with the vote of thanks. Mr. Hoyte's was an excellent contribution; and the happy vein in which it was written would render it of the very greatest use to them all for publicity purposes in their districts. He hoped, therefore, it would be published by the "B.C.G.A." Its style arrested the attention, and would convey the facts to the ladies better than could be done in any other way.

Mr. Hoyte, in acknowledging the vote of thanks, remarked that he thought the appreciation of the members showed that in their campaign use could be made of the light artillery as well as of the heavy artillery.

SCIENTIFIC AND INDUSTRIAL RESEARCH.

Report of the Committee of the Privy Council for 1924-25.

As was mentioned in last week's "Journal," there has lately been issued the Tenth Annual Report of the Committee of the Privy Council for Scientific and Industrial Research, which covers the period from Aug. 1, 1924, to July 1, 1925. Copies may be had, at the price of 3s. net (postage extra), from H.M. Stationery Office, Adastral House, Kingsway, London, W.C. 2, and Branches. The portions relating specifically to the work of the Fuel Research Board have already been reproduced (see *ante*, p. 93); but opportunity may be taken to mention now some of the other matters dealt with in the report.

The past year has, the report says, brought increased responsibilities to the Department of Scientific and Industrial Research, which are in part reflected in the larger provision made by Parliament in its estimates, and which are largely due to the closer contact that the Department is coming to have with important and urgent questions of Government policy. This development is the natural outcome of the efforts made by successive Administrations towards the better co-ordination of scientific work done for the State, and of the growing appreciation on all hands of the contribution that science can make, if steadily pursued, to the solution of the difficult problems both of modern administration and of economic reconstruction. The embarrassments and losses that the staple industries of the country are suffering, are, in the belief of the Committee, not primarily due to the neglect of science, to which attention has so often been called in recent years, and which led to the establishment of the Department of Scientific and Industrial Research in the middle of the war. But lack of scientific leadership in many industries may very easily hamper and delay recovery. The possibilities of a systematic application of the growing stream of scientific knowledge to industry are, the Committee think, immense, and probably incalculable. But the time-lag between the new discovery in the laboratory and its commercial exploitation has sometimes been very great. As the Committee point out, the Department themselves have been studying the low-temperature carbonization of coal on a works scale for seven years since Sir George Beilby first put the problem on a sound scientific basis; and commercial success has not yet been achieved. As the Committee go on to say, the application of science to industry—if new things, rather than improvements in old things, are to be achieved—is a long business at best—and expensive in both money and brains.

The Department have continued to seek the active co-operation of the industries in all the work that is being undertaken in the various research establishments, and to assist industries to build up co-operative research associations in all cases where this form of organization appears to be suitable to their needs; and the Committee see indications that some of the staple industries are more inclined than they were to realize the value of this means of organizing research into problems of common interest to the firms. As an instance, it is pointed out that the coalowners have recently founded a research association in accordance with the Department's scheme, which is financed by a levy equivalent to approximately one-hundredth of a penny on each ton of coal raised. In this case, no grant is made by the Department. However, the depressed state of trade has borne hardly on many of the existing associations; and, on the recommendation of the Advisory Council, the Committee have taken such steps as are within their powers, where the outlook has been promising, to help the industries to keep their research organizations in existence, in the anticipation that the return of prosperity will enable them to be placed on a permanent footing. During the year the British Portland Cement Research Association have decided to conclude their operations.

The Lord President has appointed Prof. G. T. Morgan, O.B.E., D.Sc., F.R.S., Professor of Chemistry at Birmingham University, to be Superintendent of the Departmental Chemical Laboratory, which is now approaching completion. The original plans of the laboratory have been modified in order to provide additional accommodation for some of the researches that are urgently required, among which may be mentioned chemical reactions at high temperatures and pressures.

A report has been received during the year from the Advisory Council with regard to the conditions which should govern the conduct of special investigations for payment made by outside bodies or firms, with reference particularly to the use of the results of such work and the charges to be made for it. As a result, proposals have been approved by the Committee, by which it is hoped to increase the usefulness to industry of the various research institutions of the Department.

The Bill for the reconstitution of the Imperial Institute and its amalgamation with the Imperial Mineral Resources Bureau has now been placed on the Statute Book. The Secretary of the Department has been appointed by the Lord President under the provisions of the Act as a Governor of the Institute, and the Governors have appointed him to be Chairman of the Laboratories Committee of the Institute.

With regard to finance, it is stated that the expenditure of the National Physical Laboratory in the twelve months ended March 31 was £173,455, of which a certain proportion was provided by fees, &c., received for work done. The expenditure on fuel research during the same period was £50,471, of which £37,050 represents the cost of work carried out at the Fuel Research Station. Receipts from testing fees and sales of bye-products totalled £2285. There are at present 21 Industrial Research Associations in active operation; and grants to these Associations amounted to £100,118. The balance of the Million Fund remaining unexpended at March 31 was £518,200. A substantial part of this balance will be required to complete the payment of grants to Associations which have not reached the end of their first grant periods, and for the payment of additional grants promised to certain Associations that have completed their first quinquennia. From the balance provision must also be made for new Research Associations (if any) that may be formed hereafter. During the year five grants have been made in aid of scientific investigations conducted by other bodies.

Research on Illumination.

The Advisory Council report that progress has been made in the various items of the preliminary programme of research on illumination to which reference was made last year; and it is hoped that the results obtained in the course of certain investigations will shortly be published as special reports. Further investigations have, however, been undertaken, including researches for the Office of Works for the benefit of Government departments generally, and certain work for the Illumination Committee of the British Engineering Standards Association. In view of the magnitude of the problems which are now receiving attention, and of others which will undoubtedly call for investigation as the science of illumination develops, the Council have considered what provision should be made for the acceleration of the progress of the work. In considering this question, they have borne in mind that the investigations are of direct interest to the community, both upon general grounds, and also as users of artificial light. Moreover, the work represents the only attempt which has so far been made in this country to undertake a comprehensive study of the problems of illumination, the success of which is bound to be seriously affected if facilities for investigation are restricted. In these circumstances, they have recommended that additional facilities should be provided at the National Physical Laboratory to enable a comprehensive programme of work to be prepared, covering the requirements of at least the next five years.

Refractories Research Association.

Dealing with the various Research Associations, the Advisory Council say: The British Refractories Research Association has been very successful in its scientific work; but it is faced

with a difficult financial situation. Research into refractories is admittedly of great national importance in view of the dependence of many industries, including the iron and steel, metallurgical, and coke-oven and gas industries, on the suitability, quality, and uniformity of the refractories which they employ. The Association has not yet, however, succeeded in obtaining the financial support of the user industries to any substantial extent, nor does the refractory industry itself as a whole appear at present to be in a position to contribute effectively towards the support of the Association. Endeavours are being made to secure wider interest in the work of the Association, with a view to placing this valuable scientific organization on a sound financial basis. Our consideration of grants to this Association over a further period of years awaits the result of these efforts, which will necessarily take some time. Meanwhile, we have recommended that grants should be continued for another year on the original conditions, subject to certain modifications.

Research on Gas Cylinders.

An expensive series of tests of experimental light cylinders of alloy steel has now been carried out at the National Physical Laboratory; and the Gas Cylinders Committee's programme of experimental work in connection with light cylinders for special purposes has been completed. A report on the possibility of using an alloy steel for such cylinders will shortly be published. Investigations on the effect of repeated low-temperature annealing and repeated normalizing on carbon steels of the kinds used in the manufacture of commercial gas cylinders, are also almost complete; and the Committee hope to publish very shortly their recommendations on the subject of the desirability of the periodical heat-treatment of gas cylinders.

British Standard Specification for Portable Photometers.

This Specification, which has just been prepared by the British Engineering Standards Association, covers the requirements for portable photometers intended for the measurement of illumination, and in some cases of brightness also, under conditions where portability and convenience in use are of more importance than great accuracy. The Specification includes definitions of the principal terms used in photometry, which terms are in accordance with the decisions of the International Illumination Commission, in so far as such decisions are applicable. It divides the photometers into two ranges—Range A being those photometers intended for use in measuring exterior illumination, and Range B being those intended for use in measuring interior illumination. It points out that, as usually constructed, portable photometers of each range may be further sub-divided into those in which the test surface is viewed through an aperture in the comparison surface, and those in which the comparison surface is viewed through an aperture in the test surface. It is specified that the effective range of a Range A portable photometer shall be from 0·01 to 2 foot-candles, and that the effective range of a Range B photometer shall be from 0·2 to 20 foot-candles. The questions of weight, the test and comparison surfaces, the use of reducing screens, the electrical measuring instruments, the comparison lamp and battery, and also the limits of error to be permitted have all been gone into carefully. Copies of the Specification (No. 230, 1925) may be obtained from the B.E.S.A. Publications Dept., No. 28, Victoria Street, London, S.W. 1. Price, 1s. 2d., post free.

Changing the Purifier System Overnight.

The Lincoln (Nebraska) Gas and Electric Light Company have recently undertaken a reconstruction programme, involving the complete demolition of the old plant and the substitution for it of modern equipment capable of meeting all possible demands. In changing-over from old to new gas plant, the most ticklish piece of work undertaken was the transfer from the old cast-iron purifying boxes, which had been in service over forty years, to new steel and concrete boxes of the modern type. It is explained by the "American Gas Association Monthly" that the storage holder was installed about eighteen years ago, with no valves at either inlet or outlet; and elaborate preparations had to be made to open the 20-in. inlet pipe, insert a tee, and connect the holder with a new station gas meter and the outlet of the new purifiers. All of the work had to be done at a point of minimum load or between 8 p.m. and midnight. The time to stop producing gas had to be determined to a nicety, and the last "run" was made at about 3 p.m. This calculation had to be almost exact, as raw gas had to be pumped from the relief holder, through the old piping and purifiers, into the storage holder; and after the dinner-hour load, when the amount of purified gas in the storage holder about equalled the capacity of the relief holder, the process was reversed, and the storage holder emptied into the relief holder, which then supplied the city during the time the change-over was being made. It was estimated that the work would take three hours, if everything worked out as planned; but preparation had been so complete, and the job so well managed, that in just one hour and thirty-five minutes the new connection was complete.

SCOTTISH JUNIOR GAS ASSOCIATION.
(WESTERN DISTRICT.)

The Western Juniors had the unique privilege on Wednesday evening, Oct. 21, of enjoying a visit to Messrs. Stewarts & Lloyds' Phœnix Tube Works, Rutherglen. This was the first occasion on which the Association had visited works of this description, and they had the advantage of seeing the plant and furnaces in full blast.

The visitors were received by Mr. Ballantine, Works Manager, Mr. Sato, Assistant Manager, and Mr. Thom. The party, having been welcomed, were divided into ten groups, and conducted round the works.

The tubes manufactured at this branch of Stewarts & Lloyds' are from ½ in. to 4 in. diameter, and are made on both the lapweld and the buttweld principle. The process commences by the plate strips going into the preheating furnace. Thence they pass through the welding furnace, are straightened, and undergo diameter correction. At this point the tubes are tested for defective welds, and are then conveyed to the galvanizing baths and the screwing and cutting machines. The tubes are put through a final test at a hydraulic bench at a pressure of 750 lbs., and after being oiled and painted are passed to the home or export bays. It is interesting to note that the percentage of rejected tubes after the final test is as low as 2·5. It was learned that about 70 p.ct. of the total output is galvanized. The chief method of furnace heating is by producer gas firing from a self-contained unit within the works.

The works are well situated, and have a siding on the main line of the L.M. & S. Railway. The plates are received at one end of the works, are carried through the various stages, and come out at the other end as finished tubes. The progress is direct in every way.

After the inspection the visitors sat down to tea under the chairmanship of Mr. Ballantine.

Mr. Ballantine remarked that this was the largest party they had ever had at the Phœnix Works. He hoped that everyone present had picked up something of special interest which might help him in his every-day work. Their firm were always anxious to turn out only first-class work. The tubes they had seen that night would stand under a pressure of 2 tons per sq. in. He condemned the idea that large output and labour-saving appliances would put workmen out of a job, and remarked that when he commenced at Rutherglen 900 men were employed. To-day, with 1500 men and more labour-saving appliances, the output was almost seven times greater. If they cultivated the spirit of efficiency, this country could compete with America or any other country.

Mr. R. Gray (Hamilton) cordially thanked the firm for the opportunity of seeing their works. In the gas industry they handled their products every day; and it had been a privilege to see the tubes in each stage of manufacture. He thanked Mr. Ballantine and Mr. Sato, and all the staff who had conducted them round the works.

The next meeting will be the annual joint meeting of the Eastern and Western Districts, on Nov. 7, at the Royal Technical College, Glasgow. Mr. Arthur Forshaw, M.Sc., is to speak on "Gas Fires, with Special Reference to Aeration."

After the meeting the Eastern members will be the guests of the Western District at tea.

Motor Fuel from the Nipa Palm.

The question of making a motor fuel in the tropics, where imported spirit is expensive, is at present attracting considerable attention. One of the most valuable materials as a source of power alcohol appears to be the sap which may be collected from the flowering shoots of the Nipa palm in the Far East. Work has been done in the Philippine Islands in ascertaining the suitability of this palm for the production of alcohol; and recently an experimental plant has been erected in the State of North Borneo. An account of the results of the first year's working, based on a memorandum supplied by the North Borneo Company, is given in the "Bulletin of the Imperial Institute." There are about 300,000 acres of nipa palm in North Borneo, occurring in nearly solid stands of 5000 acres or more. The sap flows for only six months in the year; but it is estimated that during this period 900 million gallons of sap, capable of producing nearly 60 million gallons of alcohol, could be obtained. The results of the first year's working of the experimental plant came up to expectations in every way. The still was only capable of producing 100 gallons of alcohol per working day of 12 hours, and the costs of running such a small plant were naturally somewhat high; but it is shown that a permanent plant producing not less than 1000 gallons per day should prove a commercial success. Estimates are quoted in the article of the cost of production for plants of various capacities. For a plant capable of producing 2000 gallons per day of 12 hours, the capital required is estimated at about £26,000; and the profits on the spirit delivered in Singapore or Hong Kong would be equivalent to a dividend of 10 p.ct. on the capital. An 8000-gallon plant run for 24 hours per day would require a capital of about £122,000, and this, it is estimated, would yield profits equivalent to 30 p.ct. on the capital.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Lack of Science in the Gas Industry.

SIR,—I have spent some time in trying to understand in what manner "the experiences encountered at Scunthorpe have added considerably to the technology of gas making," and why it is that the alleged failure of the Scunthorpe experiment should be a matter for rejoicing in the gas industry, though, for obvious reasons, there are many who would prefer to see the industry adhering to the methods which have been practised, with little modification, during the past century. I have read Mr. Simpson's paper very carefully. He tells us that he operated with a "glorified Tully plant;" but as the significance of the word "glorified" is not obvious, one is left in the position that one cannot make a start by taking a pencil and paper and trying to rough-out the design of the plant. No data are provided except the production details for long and short periods. No attempt is made at a thermal analysis of the process, so that one is absolutely in the dark as to whether the process is one which is based upon false assumptions, whether the principle is sound and the development of it faulty, or whether the real difficulties are mechanical, either inseparable from the process, or connected with the design of the plant.*

The process of trial and error, in which experiments are not based upon a preliminary scientific study, and in which the results are not subject to thorough scientific analysis, can lead nowhere, and it is not going to help the gas industry in its struggle with the electrical industry, in which the scientific method prevails. The following lesson is worth attention.

In January, 1880, there appeared in the "JOURNAL OF GAS LIGHTING" a leader which opens with the words: "We hope that authentic reports which have arrived from New York of the complete failure of Mr. Edison's latest invention will reassure the possessors of gas property. . . . We will admit the possible perfectibility of the electric light for both public and private illumination, but when will that perfection be arrived at? In the course of the next half-century it may be conceded that great improvements will be made, &c., &c. . . ." And yet, had it not been for the work of Fahnehjelm, Auer von Welsbach, and others, based upon experiments of a purely scientific character, in which the industry played no part, it is doubtful whether gas, as a means of illumination, would not now rank with the "flaming rags floating in oil" which produced what in the days of King Arthur they called "light." An industry cannot go on in the belief that advertisement is the soul of progress, and expect science to step in at the last moment and save it, as actually happened in this case.

I wish to call attention to the fact that in every college and technical school in this country there is a department of electrotechnics, and in most of these departments, and in many departments of pure physics, research has been, and is being, carried out for the advancement of the electrical industries. There are also many private research laboratories in which research in electricity is being carried out in connection with our large industrial undertakings. There are very few departments of fuel technology in the country, and in none of these can a great deal of attention be devoted to the chemistry, physics, and engineering of gas making. It is also very rare indeed to find that arrangements within the industry admit of those engaged in it carrying out research. The discrepancy is so amazing that one cannot discuss it; but it is useless to hide one's head in the sand, and to pretend that in the competition between gas and electricity the latter has not the advantage of an enormous reservoir of knowledge based upon sound scientific research, which the former does not possess. It is to me a very strange thing that, while the Technical Press are full of references to coke, and while an attempt is being made by advertisement to induce an unwilling public to purchase and use coke, we are almost totally ignorant of the elementary chemical and physical properties of that substance. This illustrates the point I am driving at.

M. W. TRAVERS.

147, *Queen Victoria Street, E.C.* 4,
Oct. 20, 1925.

[*As Mr. Simpson stated in the paper to which Dr. Travers refers (see "JOURNAL" for Sept. 30, p. 808), the Scunthorpe plant was fully described and illustrated (by both diagrams and photographs), and full data were given, in an article by Mr. N. E. Rambush in the "JOURNAL" for March 26, 1924, p. 768. Mr. Simpson doubtless thought it unnecessary to duplicate such recent information.—ED. "G.J."]

Co-operative Tar Distillation.

SIR,—I notice that in your issue for Oct. 21 one of your leaders is headed "Co-operative Distillation of Tar." I am anxious to correct some of the statements in that leader, as they are apt to be a little misleading to your readers.

1. It may interest you to know that Wm. Butler & Co. started distilling tar in Bristol long before Messrs. Burt, Boulton, & Haywood; our Company being founded in 1843.

2. You state that in the South and West of England co-operative tar distillation is carried out by associates of Messrs. T. H. Harvey, &c., as the distillers. This is incorrect, as Wm. Butler & Co. are the distillers of a co-operative tar purchase scheme working in Bristol, Gloucestershire, and the West of England. Messrs. T. H. Harvey's associates run an entirely different co-operative scheme in the South of England.

I should be glad if you could make it convenient to rectify the wrong impression that must have been given to your readers.

T. HOWARD BAKER,
Managing Director,
William Butler & Co. (Bristol), Ltd.

St. Philips, Bristol,
Oct. 23, 1925.

REGISTER OF PATENTS.

Gas Enrichment.—No. 239,407.

McLAREN, E., of Forfar.

No. 29,163; Feb. 7, 1925.

This invention is for a carburettor which will enable a consumer to enrich his gas with petrol vapour. The carburettor takes the form of a circular (in plan) container fitted on the supply pipe on the consumer's side of the meter. Two tubular wicks—one for the inlet, the other for the outlet—dip into the petrol, the maximum level of which is regulated by an overflow tap.

Recovering Ammonia and Ammonium Compounds. No. 239,934.

VON DER FORST, P., of Kreis Moers.

No. 14,777; June 18, 1924.

The object of this invention is to recover separately the free ammonia and the fixed ammonium compounds from "distillation gases." A further object is to recover the ammonium compounds, and more especially ammonium chloride, without employing any lime, in order to obtain waste liquors free therefrom.

The method consists in washing the gas with an aqueous solution containing fixed ammonium compounds (and originating from the gas itself) at a temperature somewhat above its dew-point, which temperature is kept exactly constant—in jet-blowers or other apparatus which effect the residue-less condensation of the ammonium chloride mist, as well as the tar fog in the gas. Subsequently the gas is washed in a cooler somewhat above its dew-point, thereby separating out the tarry matters and the fixed ammonium compounds contained in the gas; the latter in the form of a concentrated solution, part of which is returned for further washing of the gas. The ammonia remaining free in the gas passing on is recovered in any known manner; the gas, if necessary, being heated again sufficiently to enable it to leave the cooler with a temperature a little above its condensation point.

From the concentrated solution separating out in the cooler the fixed ammonium compounds are recovered in the cooler in the form of a concentrated solution from which the salts can be recovered directly by crystallization; the concentrated solution being for instance further concentrated in a scrubber or the like by means of hot air or gases. The gas leaving the cooler only contains free ammonia, which can either be recovered directly in an acid saturator as sulphate, or can be precipitated together with the gas liquor, and then expelled in suitable stills. This, however, is effected in the present case without adding any lime, inasmuch as the liquor merely contains free ammonia.

Further points are revealed in the ensuing detailed description of the apparatus and in the claims.

Subpayment Meters.—No. 239 917.

HANSFORD, J., of Enfield.

No. 14,547; June 16, 1924.

This invention relates to coin-freed meters of the type comprising a rotatable coin cup member and a valve spindle in axial alignment therewith, and a screw and nut connecting the member with the spindle, whereby upon the insertion of a coin the valve spindle may be moved longitudinally to open the valve.

The object of the invention is to allow the master valve of the meter to be operated by the owner or authorized person independently of the checking mechanism, so that an unconsumed supply of prepaid gas is not available, and leakage, unauthorized use, or fraud may be avoided. It is particularly intended for use in a "subpayment" scheme.

In the form described, this is effected by squaring the end of the valve spindle to take a key which is inserted through the hollow trunnion of the second cylindrical coin-cup element. Between the stuffing box and the rapid screw-thread on the spindle, the latter has a keyway cut; and a set-screw on a collar on the spindle engages this keyway. The collar is also provided with a ratchet; and a pawl permits rotation in only one direction. Hence axial movement, and consequently closing of the valve, may be effected by the key, independently of other parts of the mechanism. The complete design is illustrated and described in the specification.

Fraud-Prevention in Prepayment Meters.

No. 240,070.

Simpson, S., of Exmouth.

No. 7198; June 17, 1924.

This invention is for preventing fraud in prepayment gas and similar meters, and is of general application to coin-freed mechanism provided with a rotary coin holder and with a coin slot formed in a stationary plate, wherein movement of the rotary coin holder results immediately in the movement of a coin slot closure member to close the slot.

According to the invention a coin slot closure member extends across the coin slot plate transversely, and is pivoted to the plate in a position opposite the coin slot. A cam disc or collar is fixed to the coin holder concentric with the axis of rotation; and an arm upon the closure member has a projection to engage the cam disc or collar, whereby the closure member may be moved to close the slot immediately the holder is set into rotation. The cam disc or collar is provided upon the coin holder spindle or handle stem, and the closure member is formed with a recess or is cut away so that it may embrace the cam disc or collar with clearance to permit the relative movement necessary to effect closure of the coin slot. Thus rotation of the measuring wheel by means of a tool or the like inserted through the coin slot is prevented.

Smokeless Fuel and Bye-Products from Coal.

No. 239,993.

Dewar, W., of Finsbury Square, E.C. 2.

No. 20,479; Aug. 29, 1924.

This invention is for a process for the preparation of smokeless fuel and bye-products from coal, particularly bituminous coal, of the kind in which the coal is subjected to a preliminary heating treatment, at a temperature, and for a length of time, sufficient to drive off or destroy the constituents which cause fusion or caking; the gases evolved in the preliminary heating being collected and treated by any ordinary process for the recovery of bye-products.

The feature of the invention is that the coal is subjected in this preliminary heating to an average temperature of from 300° to 305° C. and for an average length of time from 100 to 120 minutes. The coal is then further heated to a temperature between 400° and 600° C. in a retort or in a multiple hearth such as is used in metallurgical practice; or a horizontal retort or rotary kiln may be made use of, or any other suitable plant capable of continuous or intermittent working. The retorts may be heated either externally or internally, or both, and the heating medium may be either gaseous or liquid, or molten metal.

In carrying out the invention, the preliminary heating may be, as above described, effected in one furnace, and the treated coal discharged and automatically conveyed to the second retort, or the equivalent, for the final carbonization. The products—gas, water, &c.—evolved from the preliminary heating are collected and treated by any convenient method, and the elimination of the water in this process will materially reduce the hydration of the final oil products. If a horizontal type of furnace is made use of, the evolved gases and vapours may be collected at intervals by pipes, as soon as possible after their formation.

The coal which is subjected to the preliminary heating may be in the form of fines, smalls, or lumps; and any of these may be used as blending material for carbonization in cases where non-caking coal is not readily available. The final product after carbonization can be either used direct, if the lumps are of suitable size, or briquetted, or used after crushing as a pulverized fuel.

APPLICATIONS FOR PATENTS

[Extracted from the "Official Journal" for Oct. 21.]

Nos. 25,359-26,021.

Badische Anilin & Soda Fabrik.—"Cooling coke." No. 25,808.

Burton, W. J.—"Gas valves." No. 25,999.

Green, H. F.—"Electric and gas fires, &c." No. 25,365.

Mueller, W.—"Gas off-take pipes for retorts, &c." No. 25,442.

Parker, C. H.—"Distillation of coal, &c." No. 25,912.

South Metropolitan Gas Company.—See Burton, W. J. No. 25,999.

Terrell, T.—"Manufacture of incandescent gas mantles." Nos. 25,583, 25,592.

Wichnevsky, G. Sokolow.—"Electric flue-gas testing apparatus." Nos. 25,459, 25,460.

LEGAL INTELLIGENCE.

CORPORATION AND GAS MAIN BREAKAGES.

Judgment Reserved.

An appeal by the Liverpool Corporation against a decision of Mr. Justice Finlay, given at the Liverpool Assizes, in favour of the Huyton and Roby Gas Company, Ltd., in a claim brought by the Company against the appellants for damages to a number of their gas mains at Roby in 1923 and 1924, came before the Lords Justices Bankes, Scrutton, and Atkin in the Appeal Court on Friday and Monday, Oct. 23 and 26. A sum of £80 damages and costs were awarded by the learned Judge.

Mr. Greaves Lord, K.C., appearing for the appellant Corporation, said the Gas Company were the owners of the gas undertaking in the district of Huyton and Roby Urban District Council, which was near Liverpool. In 1923 the Liverpool Corporation, under the powers of the Water Works Clauses Act, laid a new main through the district, and completely finished the work in that year. Some time subsequently, a leakage was found in the plaintiffs' gas mains, which was repaired; but later on there occurred two explosions of gas in an inspection chamber of the Post Office telephones. Afterwards yet another minor fracture was discovered. The amount involved was small; but behind this action was a pretty big claim from the Post Office, in regard to which the Gas Company were asking to be indemnified by the Corporation. The point in the appeal was whether the claim in the action was barred, under the Public Authorities Protection Act, as not having been brought within six months. The facts were that the work was carried out in 1923, when the trench in which the water main was laid was filled-up by the contractors and the road rolled. The whole of the work was completed by September, 1923; and the first two leakages were discovered in 1923. It was some time in June, 1924, that an explosion took place in the telephone inspection chamber; and upon examination in July, 1924, it was found that this resulted from a broken gas main. Another fracture was discovered in the same neighbourhood in September, and a further one in January, 1925. The writ was issued on Dec. 12, 1924; so that if the material date for establishing the time was the date of the discovery of the fractures, none of the cases would be barred except those before July, 1924. The point taken by the Corporation was, however, that the time within the statute began to run, not when the cause of action arose, but from the time when the act of default was committed. That would be in 1923; and accordingly his (Counsel's) submission was that the claim was out of date. The contention of the Company was that the fractures occurred because the Corporation contractors took away the supports from their gas pipes; but his submission was that the Corporation were not under any liability to provide continued support to the pipes. The learned Judge at the trial had held that the fractures were the result of the trenches of the Corporation's water main not having been properly filled in, and that the plaintiffs had brought their action within time, as the continuing fracture kept alive the liability. This decision, in his submission, was erroneous; the finding should have been that the time commenced to run from the date of the act itself, and there was no continuing liability.

Replying to Lord Justice Scrutton, Counsel stated that the claim by the Post Office was for something like £2000; and the position of the Corporation with such a length of pipe line as theirs would be serious, if it were held there was a continuing liability. The Corporation were responsible for a very large mileage of pipe lines in many districts; and if they were held liable for happenings years after the events, they would never know their position. His submission was that the authorities on the point clearly showed that the time began to run from the date of the alleged wrongful act, and not when the cause of action arose.

Mr. Singleton, K.C., on behalf of the Gas Company, argued that there was a duty on the Corporation to give the gas pipes support. As they did not do so, they were in default, and therefore guilty of a continuing negligence which rendered them liable for the damage that took place. The contention of his learned friend as to when the liability of the Corporation began was quite wrong.

At the conclusion of the legal argument, judgment was reserved.

Horstmann Gear Company's Patents Extended.

Mr. Justice Tomlin, in the Chancery Division, on Wednesday last, heard an application by Mr. Courtney Terrell, on behalf of the Horstmann Gear Company, Ltd., of Bath, for an extension of the period of three patents relating to mechanism used in the automatic control of street gas lamps, on the ground that the benefit to be derived from working the patents was lost during the war. Mr. Terrell said the use of the patented article obviated the necessity for a lamplighter, as it automatically turned the light up and down at the proper times. He read an affidavit by Mr. E. H. Horstmann, Managing Director and Secretary of the Company, and one of the joint inventors, saying that the lighting restrictions enforced during the war seriously affected the manufacture of the apparatus, and many large orders from municipal authorities were dropped. From 1916 to 1919 the works were Government controlled. His Lordship granted a three-years' extension of each of the patents.

Littlehampton Gas-Works.—On Saturday last there appeared in the "Littlehampton Post," under the title of "Littlehampton Industries," a full description of the works of the Littlehampton Gas Company. For the last thirty years Mr. A. W. Elton, Engineer and Manager, has guided the works through unexpected difficulties, particularly in 1899, when the works were flooded. The amount of gas sold last year constituted a record in the Company's history.

Bradford Gas Accounts.—The Bradford City Treasurer's annual abstract of accounts for 1924-25, issued on Oct. 23, shows a surplus on revenue account for the Gas Department of £12,973, as against an Electricity Department surplus this year of £38,724. The Gas Department contributed £13,000 to relief of rates. The net debts per head of the population in relation to various trading departments include £1 19s. for the Gas Department—the lowest debt of the big municipal undertakings—while the Electricity Department's net debt is £5 5s. per head of the population.

MISCELLANEOUS NEWS.

PROPOSED NEW GAS-WORKS AT MOSSLEY.

Demand Outstripping Supply.

On Monday, Oct. 12, the question of the erection of new gas-works was discussed at a dinner given by the Borough of Mossley to the Saddleworth Council. It may be mentioned that all the facts and figures relating to the scheme have been submitted to Mr. W. Doig Gibb; and, subject to his report being favourable, the scheme will be adopted.

Councillor J. W. Clark, proposing the toast of "Our Guests" (the Saddleworth Council), remarked that people were asking why Mossley desired a new gas-works. The reason, of course, was that the demand for Mossley's gas was rapidly outweighing the supply in both Mossley and Saddleworth. In 1884, when Mossley secured the present works at Roaches, the output was 61 million c.ft. per year. In 1925 it was 238 millions—produced at the same works, except for a few small extensions. The growth of the undertaking was amazing. Last year 220 million c.ft. was produced, so that the net increase for the period of the last report was 18 million c.ft. Extensions, or a new works, were long ago recognized as inevitable by members of the Gas Committee. On the present site they were crammed-in by roads and factories. To extend the present works to cope with increasing demand, the Corporation would have to spend £40,000 for an extra capacity of 25 p.ct. If they went further, and increased the capacity 50 p.ct., the cost would be £55,000. If they spent this, however, they would still incur the disadvantages of the old site. With a new works built at a cost of £100,000 near the railway, conditions would be greatly improved. The Saddleworth Council could rest assured that the whole scheme was being thoroughly tested; and there would be no increase in the price of gas due to the building of a new works. Some people feared electricity; but throughout the country gas and electricity were developing side by side.

Mr. W. Bennett, Engineer and Manager of the Mossley Corporation Gas-Works, reviewing local conditions, said that the Joint Tramways Board began to supply electricity in the Mossley area in 1901. The output of gas was then 91 million c.ft. In 1924 it was over 219 millions. Mossley alone sold more energy in the form of gas than the whole of the Joint Board's output of electricity in the boroughs of Mossley, Hyde, Dukinfield, and Stalybridge. To supply less energy than the Mossley Gas Committee, the Joint Board spent £36,120 on coal, from which no residuals were obtained. Against this Mossley spent £19,646 on coal, getting more energy, and at the same time obtaining £10,770 for coke and £2107 for tar and liquor. If gas were to be replaced by electricity in the area, three-and-a-half times the capital would be required to provide the same service; from two to three times the tonnage of coal would be needed; and yet, locally, only the same labour would be employed. There was no need for members of the Saddleworth Council, or anybody else, to regard with apprehension a new gas-works scheme costing £100,000. The new scheme would save £2500 a year in transport charges, £2000 in labour charges, £2000 on better results, and £2000 on works maintenance.

KEIGHLEY GAS UNDERTAKING.

Centenary Exhibition.

The hundredth milestone in a very successful undertaking was reached on Oct. 19, when a week's exhibition in connection with the centenary of the Keighley Gas-Works was opened by the Mayoress of Keighley (Mrs. Robert Calverley). Rarely has such interest been taken in gas and gas appliances by Keighley people, about 1500 of whom were present at the opening.

The exhibition comprised the stalls of various gas appliance manufacturers tastefully arranged round the large hall of the Municipal Hall, and included exhibits by the following: Messrs. Arden Hill & Co., Cannon Iron Foundries, Ltd., Parkinson Stove Company, Ltd., Wilsons & Mathiesons, Ltd., and the Keighley Corporation Gas Department.

One of the most interesting points in connection with the exhibition was that the splendid cookers on view could, from Oct. 19, be obtained on the hire-purchase system. Previously the Keighley Corporation have only allowed their cookers to be taken out on the simple hire system.

The Corporation Exhibit.

Much interest was taken in the Keighley Corporation stall, on which were several old-style cookers, gas fires, and lighting arrangements, dating back forty and fifty years. One of these was the sundial cooker, made about 1880, and another was a gas washer of 1879. Among the gas fires on the stall was one known as the fibre-fire, in which was placed what appears to be a form of plant or weed. This was lighted by the gas, and gave off heat without burning away. In contrast with these obsolete types, the modern appliances showed the greater economy and better results to be obtained from their use.

One of the most interesting exhibits was a stand on which were bottles filled with liquid bye-products. A notice stated that all these bye-products were lost when the coal was burned in the open grate.

Opening Ceremony.

The Mayor of Keighley (Mr. Robert Calverley), who presided, reviewed the life of the Keighley gas undertaking, and said it was almost like a fairy tale. Over a hundred years ago, he said, a few far-seeing men founded the Keighley Gas-Works, one of the first municipal gas-works in the country. In its early stages the venture was not very successful, and it was necessary for the promoters to receive assistance from a private individual, a Mr. Greenwood. Later, however, it began to flourish, and for some considerable time it had been paying its way and helping to lessen the burden of rates on the town. They were opening the exhibition partly in order to encourage Keighley ratepayers to use as much gas as they could, in place of burning raw coal; and if they succeeded in that alone, it would be worth while, for it would be a great step in the direction of abolishing the smoke nuisance, from which the town suffered rather badly.

Vast Improvements.

The Mayoress, declaring the exhibition open, said it was fitting that a woman should open such an exhibition, as a man would hardly understand the ease with which a meal could be cooked by gas. She herself had used gas for many years, and had cooked all her own foods; and as the Mayor was still living, it could not be so bad, after all. (Laughter.) They had only to look around the room to see the vast improvements that had been made in gas appliances in recent years; and the exhibition would give them the opportunity of seeing how economical and clean cooking could be made by gas. She hoped the women of Keighley would take advantage of the free cookery demonstrations, in order that they might benefit from them.

The cookery demonstrations were given by Miss H. H. Tuxford, of Manchester; and the arranging of the exhibits and the organization of the show were in the hands of Mr. A. Bromley (Gas Engineer to the Keighley Corporation) and Mr. F. W. Timms, of Messrs. Wilsons & Mathiesons, Ltd., of Armley.

In further celebration of the centenary, the gas-works at Thwaites were visited, on Oct. 22, by a representative party of local people, municipal officials, and visitors from other gas undertakings. After the visit the party adjourned to the Queen's Hotel for lunch, where a toast to the Keighley gas undertaking was given by Mr. J. Wilfred Drake (Messrs. Drakes Limited, constructors of the retorts in use at Thwaites), to which the Mayor responded, and remarked that in his view there would have to be a good deal of combination in the future between gas and electricity concerns. Mr. F. H. Robinson, of Harrogate, was among those who responded to the toast of "The Visitors."

SOUTHPORT EXHIBITION.

The Mayor of Southport opened an attractively staged five-day Gas Exhibition at the Cambridge Hall, Southport, on the 20th inst., at which liberal facilities for obtaining appliances on hire-purchase were offered. The following Radiation firms were among those participating in the exhibition: The Davis Gas Stove Company, Ltd., Fletcher Russell & Co., Ltd., the Richmond Gas Stove and Meter Company, Ltd., Wilsons & Mathiesons, Ltd., and John Wright & Co. Their exhibits included numerous cookers (with the "New World" in the forefront), fires, radiators, boilers, and gas irons. The Fletcher "Kingsway" and "Aldwych" cookers, with this firm's "Historic" series of gas grates, made a very pleasing impression, as did also the Davis "Alpine" and "Frontline" cookers, both upright and extended patterns. This firm's "Peerless" gas grates were well represented by popular models.

The stand devoted to apparatus by the Richmond Gas Stove and Meter Company, of Warrington and London, was complete and attractive. The special display of "Bungalow" and "Ranelagh" cookers (the former series including their new "82" and "82B" designs) fully merited the very favourable attention it claimed, while their well-known "Period" and "Standard" series of gas grates formed a pleasing and seasonable feature of the exhibit. Richmond apparatus for water heating was well represented by the "Hollar" and "Ironclad" circulating boilers, "Lyn" boilers for the sink and lavatory basin, water boilers for tea making, the "Daisy" greenhouse heater, &c.

John Wright & Co. had an attractive display of their "New Eureka" and "Black Prince" cookers (the latter an eye-level model), which created much interest. Among many examples of this firm's "Classic" gas grates should be mentioned the "Aero" design, which was finished in a very handsome art silver. Their "B.T.U." circulators, together with "St. Andrew" gas heated radiators, completed an exhibit that was a striking commentary on the variety of this firm's activities.

Wilsons' "Sunbeam" fires, which are being very widely advertised, came in for a great deal of notice. In addition, this firm showed the "York" standard gas fire, which has a neat concealed boiling burner in the canopy—an extremely useful fitment for the sick-room or nursery.

This seasonable display at Southport should do a great deal to help business in the district, which has the advantage of being to a large extent a residential area to several large cities, besides a watering-place of importance.

Results at Abertillery.—The Abertillery Urban District Council's Gas Department made a gross profit of £3875 for the year ended March 31. After payment of interest and loan charges, &c., there is a net profit available of £416. The total quantity of gas made was 87,397,100 c.ft., coal carbonized 6308 tons, and the make of gas per ton of coal 13,565 c.ft. The percentage of unaccounted-for gas was 21·4—a decrease of 4·1 p.ct.

"Better Homes" Exhibition at Leeds.—Organised by the "Leeds Mercury," an interesting "Better Homes" Exhibition was held last week at the Fenton Street Drill Hall, Leeds, specially featuring labour-saving appliances to reduce the drudgery of housework. An important section was that devoted to gas fires, cookers, &c. The exhibition was opened by the Lord Mayor and Lady Mayoress of Leeds, and embodied the stands of about sixty exhibitors.

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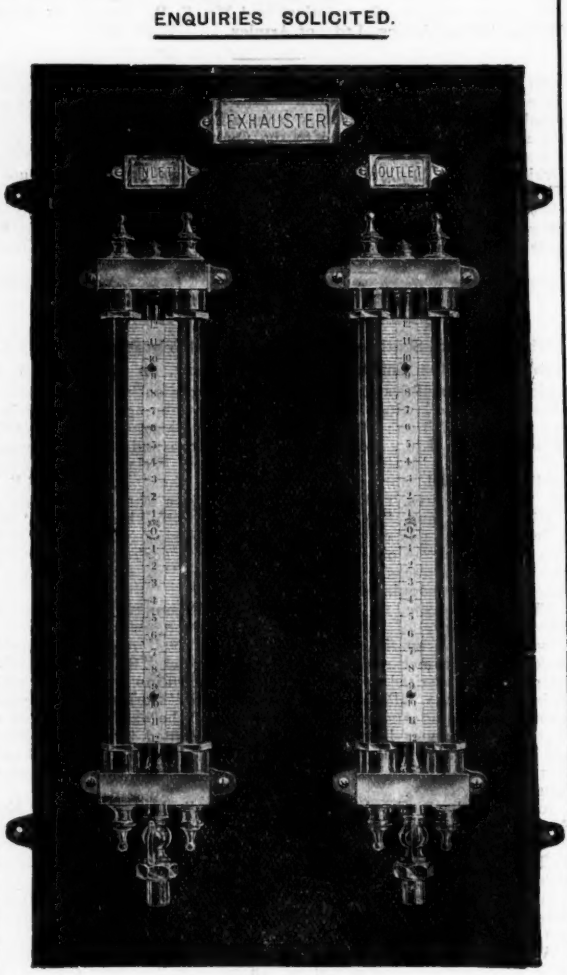

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CHAPEL WHALEY AND DISTRICT GAS COMPANY.

Objection to Alleged Suggestion at Inquiry.

The recent inquiry by the Board of Trade into the application by the Chapel Whaley and District Gas Company to erect new gas-works at Whaley Bridge had an echo at a meeting of the Chapel Rural District Council on Oct. 19, when Mr. Williamson accused an official of the Manchester Joint Town Planning Committee of misrepresentation in the course of his evidence at the inquiry.

Mr. Williamson alleged that the official had implied that the members of the Council who were also Directors of the Gas Company had influenced the Council into scheduling the area which included the site for the gas-works for industrial purposes after it had been, according to the official, tacitly agreed that the area should be scheduled as an open space. Mr. Williamson denied that the Council had definitely agreed to the site being scheduled as an open space; and to imply that the two Directors of the Gas Company had influenced their fellow councillors into changing the schedule into one for industrial purposes was, he said, to impugn the honour of the Council. The Directors concerned took no part whatsoever in the Council's business concerning the site, and neither spoke nor voted on the subject whether the Council should oppose the Gas Company's application to erect the works. The land scheduled by the Council for industrial purposes covered a wide area; and the site of the proposed new gas-works happened to come within the area. The Council's action in so scheduling the area was notified at the time to the Manchester Joint Town Planning Advisory Committee; and no objection was made until the official of the Committee took the side of the objectors to the gas-works at the inquiry.

NORTH-EAST COAST COAL TRADE.

From our Own Correspondent.

After the continuous improvement of the last few weeks, and the strong buying of all descriptions of coal, there has been something of a pause during the past week. The tone remains good, and prospects for the rest of the year are quite satisfactory, but the top prices paid lately can now be slightly discounted in some cases for early shipment.

Most Durham coals remain firm. The demand for coking makes, which a week or two ago were almost unsaleable, continues good, and appears likely to expand. Coke, too, is in active demand, and gas makes now ask as much as 22s. to 22s. 6d. f.o.b., and patent foundry brands 21s. to 23s.

The gas coal section continues good, and prices are easily maintained at 16s. 3d. to 16s. 9d. for Wear Specials, and 16s. 6d. for best qualities. Seconds are 14s. 3d. to 14s. 6d.

It is probable that the capacity for increased production will serve as a check on prices, and that thus the demand will be sustained. The volume of trade has recently been very encouraging.

COAL TRADE IN THE MIDLANDS.

From our Local Correspondent.

The market continues extraordinarily unresponsive. While mild weather postpones any appreciable increase of demand in the house coal trade, there is scarcely any symptom of freer buying in the industrial field. This is the more puzzling inasmuch as manufacturing activity has been stimulated this month. The iron and steel trades, engineering, and the heavy group generally are looking up. It is largely on the strength of inquiries that the tone has brightened; still, there has been some increase of orders, and one would have expected a sympathetic expansion in the coal markets. But for the time being business remains prejudiced by the distortions brought about by the threat of a stoppage in the coalfields three months ago. Inland pits are suffering less than those which are more directly dependent on the export trade. In the case of collieries like those of Warwickshire and Cannock Chase, where there is access to the London market and a complementary demand for industrial fuel for the service of local manufactures, employment is kept at a good level. Electricity undertakings have been able to make contracts for the fourth quarter at slightly lower prices than those previously paid, but the difference was very small indeed.

Spot lots of gas coal are obtainable even now at rates as easy as those which prevailed two months ago. Provision is ample, however, and engineers, already behind with their quota, do not care to contemplate extraneous purchases.

YORKSHIRE AND LANCASHIRE COAL TRADE.

From our Local Correspondent.

The market conditions of the coal trade do not show any appreciable difference from those prevailing during previous weeks. House coals are moving steadily, but so far, owing to the mild weather, there has been no brisk demand.

The industrial situation shows no sign of improvement, and many of the larger consuming trades are working from week to week at reduced hours. There is a feeling, however, that the iron and steel trades will show better results in a few months, although the orders placed, as recently reported in the Press, are not of sufficient magnitude to suggest an immediate return to normal activity.

Gas coals are moving freely under contract, with indications of reduced figures for the commoner kinds for "spot" sales.

Washed fuels for export are firm, particularly washed doubles, and recently increased f.o.b. prices are maintained. Hards are also in demand, but exporters are finding some difficulty in respect to tonnage, there having been a scarcity of suitable boats for some weeks.

Humber bunker and export prices (f.o.b. usual shipping ports) are as follows: South Yorkshire.—Hards, Association, 18s. 3d. to 18s. 6d.;

screened gas coal, 17s. 6d. to 18s. 6d.; washed trebles, 19s. to 19s. 6d.; doubles, 18s. 3d.; singles, 17s. 6d.; smalls, 13s. 6d.; unwashed doubles, 15s. 9d. to 16s.; rough slack, 9s. 3d. to 9s. 6d.; smithy peas, 18s. to 20s. per ton. West Yorkshire.—Hartleys, 16s. 6d.; screened gas coal, 16s. 6d.; washed trebles, 17s. to 17s. 6d.; doubles, 16s. 6d.; singles, 15s. 6d.; smalls, 12s. 6d.; unwashed doubles, 13s. to 13s. 6d.; rough slack, 9s. 3d. to 9s. 9d.; coking smalls, 9s. 6d. to 10s. per ton. Derbyshire and Nottinghamshire.—Top hards, 19s. 6d. to 20s. 6d.; washed trebles, 18s. to 18s. 3d.; smalls, 12s. 6d. to 13s.; unwashed doubles, 14s.; rough slack, 9s. to 9s. 6d. per ton. Yorkshire, Derbyshire, and Nottinghamshire.—Screened steam coal, 16s. to 17s.; gas coke, 20s. to 25s.; furnace coke, 19s. to 21s. 9d.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

London, *Oct.* 26.

A moderate amount of business continues to be done in pitch, which remains steady at about 41s. 6d. to 42s. per ton, net, f.o.b. works. It is interesting to note that the exports during September total 17,740 tons, as against 9330 tons in September, 1924. The total exports over July-September were 30,257 tons, as against 11,204 tons for the corresponding period last year.

Creosote continues in demand, and higher prices are expected. The quotation to-day is firm at not below 7d. per gallon, at works.

Other products are unchanged at the prices last recorded.

Tar Products in the Provinces.

Oct. 26.

Generally speaking the markets for tar products continue without alteration.

Pitch is quiet but steady. Continental consumers report having made purchases at 40s. 6d. f.o.b.; but there are indications that they would be prepared to advance a trifle on this figure for January-March delivery. East Coast port pitch has been sold for near delivery at 41s.; while on the West Coast 40s. 6d. is reported to have been accepted.

Creosote is still firm. The big demands by the English railway companies have improved the tone of the market. There is no great demand yet for export; but it is believed that foreign buyers still have a considerable quantity to purchase for this year's consumption.

Water-white products are firm, but without any alteration in price. Cresylic acid is in rather better demand for near delivery, but prices still continue low. Naphthalene and anthracene are practically unsaleable.

The average values for gas-works products during last week were: Gas-works coal-tar, 27s. 9d. to 32s. 9d. Pitch, East Coast, 40s. to 41s. f.o.b. West Coast—Manchester, 34s. 6d. to 35s. 6d.; Liverpool, 35s. 6d. to 36s. 6d. Clyde, 37s. to 39s. Benzole, 90 p.ct., North, 1s. 7½d. to 1s. 8½d.; crude, 65 p.ct., at 120° C., 1s. to 1s. 1d., naked at makers' works; 50-90 p.ct., naked, North, 1s. 7½d. to 1s. 8½d. Toluole, naked, North, 1s. 6½d. to 1s. 7½d., nominal. Coal-tar crude naphtha, in bulk, North, 7½d. to 8½d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 6d. Heavy naphtha, North, 1s. to 1s. 2d. Creosote, in bulk, North, liquid, 5⅝d. to 6d.; salty, 5¾d. to 6d. Scotland, 5⅝d. to 5⅞d. Heavy oils, in bulk, North, 6½d. to 6¾d. Carbolic acid, 1s. 4d. to 1s. 5d. prompt. Naphthalene, £11 to £14; salts, £4 to £5, bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

Manchester District Tar Prices.

The average price realized for the sale of tar in the Manchester district, according to the sliding-scale, for the month of August was £2 7s. 3·74d.

TRADE NOTES.

Messrs. Ashmore, Benson, Pease & Co., Ltd.

This firm have published a pamphlet illustrating recent contract work accomplished by them in this country and abroad, together with their principal manufactures.

British Furnaces, Ltd.

This firm have recently completed an order from the Royal Arsenal, Woolwich, for the supply of ten town-gas fired recuperative furnaces of their patent "R.B." type.

Messrs. Edward Cockey & Sons, Ltd.

We learn that the Great Western Railway Company have placed an order with Messrs. Edward Cockey & Sons, of Frome, for an installation of elevated purifiers complete with 18-in. "Sadler-Cockey" patent reversible centre valve, for their gas-works at Swindon. This firm have a similar contract in hand for the L.M.S. Railway Company's Gas-Works at Crewe; and also an installation of four 50 ft. square purifiers with reversible valve for the Portsea Island Gas Company.

Tools for Gas-Works.

In 1924, £964,203 worth of tools were imported into this country, which should be the home of the tool industry. A pamphlet has been prepared by Messrs. Abbott, Birks & Co., No. 113, Newington Causeway, London, S.E. 1, illustrating tools which are of particular interest to gas engineers—such as pipe wrenches and cutters, vices, &c. These appliances have been definitely designed to compete with the American patterns; and the manufacturers claim that they are equally as good, and equally as low in price, as the foreign-made article.

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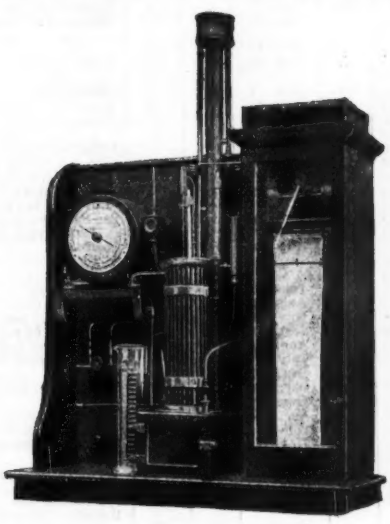

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STOCK MARKET REPORT.

WHILE there are signs that trade is beginning to improve, the outlook in all industries seems scarcely to justify the optimism that has prevailed on the Stock Exchange during the past two weeks, and investors should not allow the general enthusiasm to outweigh the facts. The recovery in the New York exchange has relieved the anxiety regarding an upward movement in the Bank Rate; and were it not for the collapse of the Paris exchange, the prospects would be most encouraging. Enormous business has been done in the popular Industrials and in the Rubber Market, and there are many complaints of overwork from brokers and their staffs. In the Rubber Market the issues of the Allied Sinatra Plantations and the British Rubber and General Trust will be of interest, as it is becoming increasingly difficult for speculators to find cheap shares. The announcement that the Government has decided to guarantee loans up to £10,000,000 for development work in Kenya Colony is satisfactory, as it will create a demand for material from this country.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Oct. 23.	Rise + or Fall − on Week.	Transactions Lowest and Highest Prices.
£			% p.a.	% p.a.				
171,978	Stk.	Aug. 13	5	5	Aldershot 5 p.c. max. C.	75—78	..	..
295,492	,,	,,	4	4	Do. 4 p.c. Pref.	70—75	..	..
1,551,868	,,	Oct. 8	6½	6½	Alliance & Dublin Ord.	68—72	+4½	73½—73½
374,000	,,	July 9	4	4	Do. 4 p.c. Deb.	60—65	..	70
300,000	1	Oct. 22	1/7⅞	1/7⅞	Bombay, Ltd.	½—1*	..	62½
170,000	10	Aug. 13	8½	8½	Bournemouth 5 p.c.	12—13	..	..
425,050	10	,,	7	7	Do. B 7 p.c.	12—12½	..	12⅜—12½
150,000	10	,,	6	6	Do. Pref. 6 p.c.	11—12	..	11½
50,000	Stk.	June 25	3	3	Do. 3 p.c. Deb.	56—59	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb.	77—80	..	..
992,045	,,	July 9	6⅞	6⅞	Brentford A Con.	93—100	+2	93—96½
990,500	,,	,,	6⅝	6⅝	Do. B New	93—100	+2	97½
76,000	,,	,,	5	5	Do. 5 p.c. Pref.	94—97	..	..
306,690	,,	June 11	4	4	Do. 4 p.c. Deb.	76—81	..	78½
181,337	,,	,,	6	6	Do. 6 p.c. Rich. Red. Deb.	100—105	..	..
214,740	,,	Aug. 27	12½	12	Brighton & Hove Orig.	166—171	..	..
244,200	,,	,,	9½	9	Do. A Ord.	132—137	..	..
1,287,500	,,	July 23	5	5	Bristol 5 p.c. max.	89—91a	..	..
853,000	,,	Oct. 8	7	8	British Ord.	103—108	+1	106—106½
100,000	,,	June 25	7	7	Do. 7 p.c. Pref.	120—125	..	121½—122½
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	71—76	..	..
100,000	10	May 21	6	8	Cape Town, Ltd.	6½—7½	..	..
100,000	10	Apl. 23	4½	4½	Do. 4½ p.c. Pref.	6—6½	+½	..
150,000	Stk.	June 25	4½	4½	Do. 4½ p.c. Deb.	69—74	..	..
626,860	,,	July 23	6	6	Cardiff Con. Ord.	98—101	..	..
237,860	,,	June 25	7½	7½	Do. 7½ p.c. Red. Deb.	101—104	..	..
157,150	,,	Aug. 13	6½	5	Chester 5 p.c. Ord.	90—95b	..	..
1,513,280	,,	July 23	5/14/8	5⅝	Commercial 4 p.c. Cap.	78—83	..	78—80½
360,000	,,	,,	5⅝	5/3/4	Do. 3½ p.c. Cap.	78—83	..	78
475,000	,,	June 11	3	3	Do. 3 p.c. Deb.	56—59	..	..
800,000	,,	Oct. 8	—	4	Continental Union, Ltd.	38—43	..	39½—41
200,000	,,	,,	7	7	Do. 7 p.c. Pref.	87—90	..	89
660,000	,,	Aug. 13	6½	6½	Croydon sliding scale	96—100	..	..
284,975	,,	,,	5	5	Do. max. div.	81—84	..	..
492,270	,,	Aug. 13	9	6	Derby Con.	107—109c	..	..
55,000	,,	June 25	4	4	Do. Deb.	74—76c	..	..
1,002,180	10	July 23	4	6	European, Ltd.	7—8	..	7—7⅛
16,460,070	Stk.	Aug. 13	5½	5½	Gas Light & Coke 4 p.c. Ord.	81½—83½	+2	80—82
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	60—63	..	60—61
4,062,235	,,	,,	4	4	Do. 4 p.c. Con. Pref.	77—80	..	78½—80
4,761,930	,,	June 11	5	5	Do. 5 p.c. Con. Deb.	58—61	..	59½—60½
130,000	,,	—	10	10	Do. 10 p.c. Bonds	..	..	..
42,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb.	..	..	..
82,500	,,	Sept. 10	6½	6½	Hastings & St. L. 5 p.c. Conv.	90—95	..	..
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	71—76	..	..
70,000	10	Sept. 24	10	10	Hongkong & China, Ltd.	18½—19½	..	19½—19½
86,600	Stk.	Aug. 13	10	10	Hornsey 7 p.c.	132—137	..	..
1,976,000	,,	May 21	10	59	Imperial Continental Cap.	147—152	..	147—148½
226,170	,,	Aug. 13	3½	3½	Do. 3½ p.c. Red. Deb.	70—73	..	..
235,242	,,	Aug. 13	6½	6½	Lea Bridge 5 p.c. Ord.	94—99	..	..
2,127,340	,,	Aug. 13	5½	5½	Liverpool 5 p.c. Ord.	82½—83½b	+½	82½
600,000	,,	Sept. 24	7	7	Do. 7 p.c. Red. Pref.	101½—103½b	..	102½—103
165,736	,,	Aug. 27	8	9	Maidstone 5 p.c. Cap.	118—128	..	..
63,480	,,	June 25	3	3	Do. 3 p.c. Deb.	55—60	..	..
75,000	5	June 25	3	7	Malta & Mediterranean	4—4½	..	4½
541,920	Stk.	June 11	4	4	Montevideo, Ltd.	68—72	..	69½
2,061,325	,,	Aug. 13	5	5	Newcastle & Gateshead Con.	71—72d	..	..
300,929	,,	,,	4	4	Do. 4 p.c. Pref.	75½—76½d	..	..
529,705	,,	June 25	3½	3½	Do. 3½ p.c. Deb.	68—69d	..	..
15,000	,,	Aug. 27	12	11½	North Middlesex 10 p.c.	160—170	..	..
75,940	,,	,,	8⅝	8⅝	Do. 7 p.c.	115—120	..	..
300,000	Stk.	May 7	9	7	Oriental, Ltd.	100—105	..	..
188,120	,,	June 25	7⅛	7½	Plym'th & Ston'house 5 p.c.	108—113	..	..
60,000	50	Aug. 27	14	14	Portsea Island B	93—96	..	..
100,000	50	,,	13	13	Do. C	90—95	..	..
2,289,909	1	—	—	—	Primitiva Ord.	12/6—13/6	+-/3	12/6—13/3
302,600	100	June 2	4	4	Do. 4 p.c. Red. Deb.	78—80	..	..
600,000	Stk.	July 23	4	4	Do. 4 p.c. Red. Deb. 1911	65—67	..	..
193,744	,,	June 25	4	4	Do. B. Aires 4 p.c. Rd. Db.	65—67	..	65½—66½
264,496	,,	,,	4	4	Do. R'r P'te 4 p.c. Rd. Db.	64—66	+1	66
150,000	10	Sept. 24	6	6	San Paulo 6 p.c. Pref.	7½—8	..	..
125,000	50	July 1	5	5	Do. 5 p.c. Red. Deb.	42—45	..	..
270,000	Stk.	Aug. 27	5½	5½	Sheffield A	101—102e	..	—
419,968	,,	,,	5½	5½	Do. B	101—102e	..	—
1 047,000	,,	,,	5½	5½	Do. C	101—102e	..	..
90,000	10	June 11	6	4	South African	7—9	..	7½
6,609,895	Stk.	Aug. 13	6½	5	South Met. Ord.	90½—92½	+½	91—91½
1,893,445	,,	July 9	3	3	Do. 3 p.c. Deb.	57—60	..	58½—59
734,000	,,	Sept. 10	6½	6½	Do. 6½ p.c. Red. Deb.	101—103	..	101½
91,500	,,	Aug. 13	8½	8½	South Shields Con.	131—133d	..	..
1,187,795	,,	July 23	6½	6½	South Suburban Ord. 5 p.c.	95—98	..	—
368,837	,,	June 25	5	5	Do. 5 p.c. Deb.	95—98	..	..
647,740	,,	Oct. 22	5	5	South'mpt'n Ord. 5 p.c. max.	78—81*	−2	81½—81½
121,275	,,	June 25	4	4	Do. 4 p.c. Deb.	70—75	..	74
250,000	,,	Aug. 27	7	7	Swansea 7 p.c. Red. Pref.	100—102	..	..
200,000	,,	June 25	6½	6½	Do. 6½ p.c. Red. Deb.	101—103	..	..
120,000	,,	July 23	8	7½	Tottenham District A 5 p.c.	105—110	..	..
882,275	,,	,,	6½	5½	Do. B 3½ p.c.	85—90	..	86—87
150,000	,,	July 9	—	28/4	Do. 5½ p.c. Pref.	103—105	..	..
181,255	,,	June 11	4	4	Do. 4 p.c. Deb.	76—79	..	76½
258,251	,,	Aug. 27	5	5	Tynemouth Con. and New Uxbridge, Maidenhead, & Wycombe 5 p.c.	69—71d	..	..
197,294	,,	Aug. 27	6½	6½	Do. 5 p.c. pref.	93—98	..	..
88,330	,,	,,	5	5	Do. 5 p.c. Maidenh'd	93—98	..	..
91,800	,,	,,	6½	6½	Wandsworth, Wimbledon, and Epsom—	88—93	..	..
50,000	,,	July 9	9½	8½	Wandsworth A 5 p.c.	125—130	..	..
235,636	,,	,,	7½	7	Do. B 3½ p.c.	107—112	..	..
392,955	,,	,,	6/9/6	5/19/0	Do. C and New	90—95	..	..
352,000	,,	,,	7⅜	6½	Wimbledon 5 p.c.	100—105	..	..
98,000	,,	,,	7⅜	7½	Epsom 5 p.c.	110—115	..	..
88,416	,,	June 25	3	3	3 p.c. Deb.	56—59	..	..

Quotations at:—*a*.—Bristol. *b*.—Liverpool. *c*.—Nottingham. *d*.—Newcastle. *e*.—Sheffield. * Ex. div.

It is gratifying to be able to report a continuation of the improvement recorded last week in the Gas Market. After the months of depression, during which investors in gas stocks and shares have watched the gradual depreciation of their investments, the reaction, though slight, comes as a welcome relief. It is not easy to determine the reason for the sudden change. After the market failed to respond to the effect of cheaper money, there seemed no reason to suppose there would be any improvement until the end of the year and the publication of the current year's accounts. It is possible that the reason may be found in the rumours of a steadying in the residuals prices. Whether this is correct or not, it seems clear that the demand is improving, and the heavy stocks of coke are gradually being reduced. It will be observed from the Table that the only reduction in the quotations was an *ex* div. fall of 2 points in the Southampton 5 p.c. maximum stock.

The following transactions were recorded during the week:

On Monday, Bournemouth "B" 12⅜, British 106, 106½ *ex* div., Continental Union 39½, 40 *ex* div., European 7½, 7⅝, Gas Light and Coke 80½, 80½, 80⅝, 81, 4 p.c. preference 78½, 3 p.c. debenture 59½, Imperial Continental 147, 148, Ottoman 2s. 6d., Primitiva 12s. 6d., 12s. 7½d., 12s. 10½d., 13s., 4 p.c. (Buenos Ayres) debenture 65½, 66½, South Metropolitan 91½, 91⅝, 3 p.c. debenture 59, Southampton 5 p.c. maximum 81½, 4 p.c. debenture 74, Tottenham "B" 86, 87. Supplementary prices, Hampton Court 5 p.c. consolidated 103½, 104.

On Tuesday, Aldershot 4 p.c. preference 73½, Bournemouth 6 p.c. preference 11½, Brentford "A" 94⅜, 4 p.c. debenture 78½, British 7 p.c. preference 121½, Continental Union 40½ *ex* div., Gas Light and Coke 80, 80½, 80½, 80⅝, 80⅞, 3½ p.c. maximum 60, Liverpool 7 p.c. preference 102½, 103, Montevideo 69½, Primitiva 12s. 6d., 12s. 10½d., 13s., South Metropolitan 91, 91½, 91⅝, 6½ p.c. debenture 101½, Southampton 81⅛, Tottenham 4 p.c. debenture 76½.

On Wednesday, Alliance and Dublin 70 *ex* div., Bournemouth "B" 12⅜, Brentford "A" 94, 96, Continental Union 40½, 40½ *ex* div., Gas Light and Coke 80½, 80⅝, 80⅞, 81, 81½, 81⅝, Imperial Continental 147, 147½, 148½, Primitiva 12s. 10½d., 13s., 13s. 1½d., 13s. 2½d., 13s. 3d., South Metropolitan 91, Southampton 4 p.c. debenture 74. Supplementary prices, Kingston-upon-Thames ordinary 104, 105, Portsea Island 4 p.c. debenture 74.

On Thursday, Alliance and Dublin 4 p.c. debenture 62½, Brentford "A" 93, 96½, Commercial 4 p.c. 78, 80½, 3½ p.c. 78, European 7, Gas Light and Coke 81½, 81½, 81⅝, 82, 3½ p.c. maximum 60, 61, 4 p.c. preference 80, 3 p.c. debenture 60½, Hongkong and China 19½, 19⅛, 19⅜, 19½, Imperial Continental 148½, Primitiva 13s., 4 p.c. (River Plate) debenture 66, South African 7½, South Metropolitan 91½, 91⅝, 3 p.c. debenture 58½, Tottenham "B" 87. Supplementary prices, Aldershot 4 p.c. preference 73¾, 73½, Bournemouth new "B" 12⅝, 12⅜.

On Friday, Bournemouth "B" 12⅝, Brentford "B" 97⅜, British 106, 7 p.c. preference 122½, Continental Union 41, 7 p.c. preference 89, European 7, Gas Light and Coke 81½, 82, 82⅜, 82½, 82⅝, 83, 4 p.c. preference 79½, Hongkong and China 19⅜, Imperial Continental 147½, Malta and Mediterranean 8zs. 6d., Primitiva 12s. 9d., 13s., 13s. 1½d., 13s. 3d., South Metropolitan 91, 91½.

Conditions in Lombard Street were more comfortable, the position being easier by reason of the absence of withdrawals for balance-sheet purposes. Old day-to-day money was renewed at 3½ p.c.; while fresh loans at the close of business were obtainable at 3 p.c. and under. Discount quotations hardened on the announcement of the Treasury Bills result, which were allotted at £3 14s. 9'79d. p.c., being nearly 2s. 2d. p.c. above the previous week's average rate.

In the Foreign Exchange Market, Sterling on New York improved just before the close, and touched 4.84⅜. French francs continued in what has been described as a "wild state," and in the Paris Bourse were quoted as high as 116.10. Italian lire were stronger, the Milan rate closing at 120⅞.

Silver was very quiet, the cash price remaining at 33½d. per oz. in the absence of business. Gold was unchanged at 84s. 11½d.

The Bank Rate is 4 p.c., to which it was reduced from 4½ p.c. on Oct. 1. Bankers' deposit rates are 2 p.c. The deposit rates of the discount houses are 2 p.c. at call and 2½ p.c. at notice.

Nottingham Gas Exhibition.—At this Exhibition, an account of which was given in last week's "Journal," Lighting Trades, Ltd., Nos. 51-57, Garratt Lane, London, S.W. 18, gave a working exhibition of the manufacture of "Zeimar" gas mantles. The exhibit was situated on the stand of Messrs. Pearson Bros., of Nottingham; and the following processes were demonstrated by skilled operators: Knitting of ramie yarn, ring tying and pleating, and burning and shaping, of both upright and inverted types of mantle. This display created considerable interest among the visitors to the exhibition.

Gas Centralization in Potteries.—Sanction to borrow £120,000 for a big scheme of gas centralization was sought by the Stoke-on-Trent City Council at a Ministry of Health inquiry on Oct. 16. The Town Clerk (Mr. E. B. Sharpley) explained that the money was required for new plant for the third portion of a large scheme for centralization of gas manufacture at Etruria, where works had recently been purchased from the British Gaslight Company. The total cost of the present scheme was £273,000. The extension of the plant would enable the existing works at Burslem and Longton to be closed.

Exhibition at Batley.—During the period of the Batley Shopping Week, from Oct. 23 to 31, the Batley Corporation Gas Department are holding a public exhibition of domestic and other gas appliances in the Textile Hall. During the shopping festival period all appliances are being offered for sale (either direct or on hire-purchase terms) at specially reduced prices, and fixed free up to 20 ft. of piping. The exhibitors at the show, in addition to the Corporation Gas Department, are Messrs. Wilsons & Mathiesons, the Cannon Iron Foundries, R. & A. Main, and the Welsbach Light Company.

As a result of last municipal year's working, the Todmorden Gas Department made a profit of £15,503.

The Brixham (Devon) Gas Company, who possess the statutory powers, have circularized the inhabitants of the Parish of Churston Ferrers with a view to ascertaining what definite demand there is for gas. This follows upon a report presented at the last meeting of the Churston Ferrers Parish Council as to the possibility of obtaining a supply from the Torquay Gas Company.

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Apply, giving References, Age, and Salary required to No. 7605, "Gas Journal," 11, Bolt Court, Fleet Street, E.C. 4.

GASFITTERS wanted for Coin Meter and Fittings Installations; 1s. 2½d. per hour. Permanent Positions for suitable men.
Rochester, Chatham, & Gillingham Gas Company, 95, High Street, Rochester.

APPOINTMENTS, &c., WANTED.

DISTRIBUTION SUPERINTENDENT.

ENERGETIC, Practical Superinten- dent, of good Address, desires APPOINTMENT as above, or as Commercial Assistant with full control of Outdoor Department. Progressive Company preferred, where ability to Organize and Control will be appreciated, and substantial Remuneration paid.
Inquiries to No. 7604, "Gas Journal," 11, Bolt Court, Fleet Street, E.C. 4.

PLANT, &c., FOR SALE & WANTED.

GAS PLANT IN STOCK.

GASHOLDER & Steel Tank. 10,000 c.ft.
Purifiers.—Dry lutes: Two 20 ft. by 14 ft., Two 10 ft. by 8 ft. Water lutes: Four 8 ft. sq., Two 8 ft. sq., One 10 ft. by 8½ ft.
Livesey Washers.—250,000 and 200,000 c.ft.
Tower Scrubbers.—4½ ft. by 36 ft., 4½ ft. by 18 ft.
Condensers.—Water cooled, 500,000 c.ft. per day. Two New Sets Blakeley's Baffle-Plate Condensers.
Exhausters.—2000 to 50,000 per hour capacities.
Station Meters.—Capacities: 15,000, 8000, 5000, and 3000. Also 100, 200, and 300 lt. Meters.
Weighbridge.—Suitable for Gas-Works, 12 by 6.
Station Governors.—4 in., 5 in., 6 in., and 8 in.
Storage Tanks.—All types and capacities.
Valves, Pumps, Engines, Cast and Riveted Piping, &c.
Complete Detailed List on Application.
Firth Blakeley, Sons, & Co., Ltd.
(Second-hand Plant Dept.),
Vulcan Ironworks, Church-Fenton, Yorks.

THE Haywards Heath District Gas Company have for DISPOSAL the following SECOND-HAND PLANT:
STATION METER (Gas Meter Co., Ltd.). Capacity, 1,500 c.ft. per hour; 6 in. Connections.
CONDENSERS, 8 Loop Vertical, 18 ft. high 6 in. Cast-Iron Tubes.
PURIFIERS, Two 8 ft. 6 in. by 7 ft., Water Luted, with Two-Way Valves and 6 in. Cast-Iron Connections.
Biggs-Wall SCOOP CHARGING MACHINE, with 30 yds. run of Rails.
Four New ⊏ RETORTS, 22 in. by 16 in. by 8 ft. 6 in.
Vertical STEAM ENGINE, with Pulley Wheel, 8 in. Stroke 5 in. Piston.
Further Particulars may be obtained from the undersigned.
Alec. E. Whitcher,
Engineer and General Manager.
Gas Offices,
Haywards Heath,
Oct. 23, 1925.

FOR SALE.—Marshall's Economic Cornish Multitubular BOILER, 10 ft. 6 in. long by 4 ft. 6 in., 100 lb. pressure; also Horizontal 9 in. ENGINE; all Fittings, Donkey Pump, Brass Tubed Water Heater, &c., &c.—a bargain, £120 the lot.
Apply to the Manager, Gas Works, Shaftesbury, Dorset.

STEAM-BOILERS For Sale—All Sizes, Vertical, Loco-type, Cornish, Portable, and Other Types of Boilers.
Apply
Grantham Boiler & Crank Co., Ltd., Grantham.

SECOND-HAND Gas Lanterns and Pillars (50), modern, Glasgow Pattern; Excellent Condition—Gas being discarded in favour of Electric light.
Apply Municipal Supplies, Ltd., 10a, Salisbury Road, Edinburgh.

GAS Plant for Sale—Cheap.
One Livesey WASHER, 100,000 c.ft. per diem, 8 in. Valves and Connections.
One Cast-Iron TOWER SCRUBBER, 3 ft. 6 in. by 12 ft., with Tippler 8 in. Valves and Connections, nearly New Wood Grids.
T. V. Bond, Engineer, Plains of Waterloo, Ramsgate.

FOR Sale—Cheap, Kirkham Rotary WASHER; 7 ft. long, 4 ft. dia., complete with ENGINE. Three 8 in. Valves and Connections.
F. G. Mathews, Gas-Works, Chertsey.

TWO 40-H.P. Stockport Gas Engines (Producer Gas) with Dawson Plant and Two Dynamos (British Schubert & Co.), with spare Armature, complete with Marble Switch Panels, &c. All in good Condition. Can be seen running by Appointment.
G. Philip & Son, Ltd., Victoria Road, Willesden Junction, N.W. 10.

STOCK ISSUES.

By Order of the Directors.
THE GOSPORT DISTRICT GAS COMPANY.
(Established 1835; Incorporated 1865.)
MESSRS. A. & W. RICHARDS
are Instructed to OFFER FOR SALE BY TENDER
£25,102 New Capital
comprising
£2100 FIVE PER CENT. REDEEMABLE MORTGAGE BONDS,
to be redeemed at Par on the 1st January, 1936.
Minimum Price of Issue, £97 per £100,
Yielding £5 8s. 6d. per cent.

£6650 FIVE PER CENT. IRREDEEMABLE PREFERENCE STOCK.
Minimum Price of Issue, £84 per £100,
Yielding £5 19s. 1d. per cent.

£16,352 CONSOLIDATED ORDINARY STOCK,
ranking for a Standard Dividend of 6 per cent. per annum, subject to the Sliding Scale, equally with existing similar Stock now receiving £7 1s. per cent. per annum.
Minimum Price of Issue, £97 per £100,
Yielding £7 5s. 4d. per cent.

Prospectus and Forms of Tender (which latter must be sent in by 11 o'clock on Thursday, Nov. 12) may be obtained of Messrs. A. & W. Richards, 37, Walbrook, E.C. 4.